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Plioform

A New Molding Resin[1]

H. R. Thies and A. M. Clifford [2]

IN THEIR complete paper[3] the authors give particular attention to those reactions of the rubber hydrocarbon leading to the formation of resinous and thermoplastic products and the development of Plioform. This abridgment is confined to that portion relating to the characteristics of Plioform resins, their comparison with hard rubber and behavior as thermoplastics.

Characteristics of Plioform Resins

It is possible to produce a number of grades of resin in so far as the physical properties are concerned. Almost all these grades have certain properties common to the whole group, with variation in only a few characteristics. These resins, as a whole, are true thermoplastics; they are inherently resistant to most acids, all alkalies, and solvents of the acetone type; they are universally soluble in solvents of the gasoline or benzene type. Their resistance to moisture and their excellent electrical properties apply to the whole group. This group of materials is universally odorless and tasteless. The various resins differ, however, in the temperature at which they become deformable and in such properties as impact strength and flexural strength. It is uniformly true that resins which lie in the lower range of softening points are tough and nonbrittle; while the resins which lie in the higher range of softening points tend to become brittle and easily breakable. Experimentally this range of temperature runs from 120° to approximately 220° F.

It has been found that most commercial applications for this type of molding resin can be filled with 2 grades of the material. In applications where a tough, nonbrittle product is wanted, Plioform (the commercial name for these resins) is furnished in a grade which shows distortion under heat at approximately 175° F. In applications where heat resistance above the boiling point of water, such as sterilization, is desired, a second grade is furnished possessing a distortion point of about 220° F.

Using these 2 grades as raw material, the method of fabricating articles from them is that common in the well-known use of any thermoplastic. The molding powder, or preform, is introduced into the heated mold and formed to the desired shape under pressure. Depending upon the type of resin employed, the mold temperatures may vary from 260° to 310° F., and the molding pressure from 1,000 to 3,000 pounds per square inch. As soon as the article is formed, the mold is cooled, and when the surface temperature of the molded article is approximately 100° F. below that of the molding temperature, it is possible to open the mold and remove the piece.

Comparison with Rubber

Plioform's behavior is interesting in so far as its softening point is concerned. If one uses the Shore hard-rubber durometer reading as an indication of softening of the material and studies the behavior of Plioform over a range of temperatures, it is found to differ from the usual vulcanized rubber product in that the softening point appears sharply and at a lower temperature than with vulcanized rubber. In ordinary vulcanized rubber practice one considers the ratio between durometer reading and temperature as a fairly straight-line function until quite high temperatures are reached; that is, the hardness of the stock uniformly decreases as the temperature is raised. The behavior of Plioform in this respect is quite different in that there is no marked decrease in hardness during the initial rise of temperatures until one reaches the region of the softening point. When this region has been reached, there is a sharp decrease in durometer hardness with small temperature rise. In other words the behavior of Plioform resin more nearly approximates the behavior of a chemical compound pos-

[1] Presented before the Division of Rubber Chemistry at the 86th Meeting of the American Chemical Society, Chicago, Ill., Sept. 10 to 15, 1933.
[2] The Goodyear Tire & Rubber Co., Akron, O.
[3] *Ind. Eng. Chem.*, Feb., 1934, pp. 123-29.

sessing a melting point than does ordinary vulcanized soft or hard rubber.

Another interesting difference in behavior between these resins and the usual products with which a rubber technologist is familiar is the behavior in milling. In the process of manufacture Plioform resin is milled just as rubber is milled, but there is a remarkable difference in behavior between the 2 substances during this milling operation. Pale crepe rubber mills at a temperature somewhat under 212° F., and factory practice has shown that the power consumption of crude rubber is approximately one h.p. per inch of mill; that is, a 60-inch mill requires 60 h.p. to mill a batch of rubber; while an 80-inch mill requires 80 h.p. for the same operation. When Plioform is milled, the milling temperatures are exceedingly high, sometimes reaching 325° F., and power consumption studies have shown that a figure of 5 h.p. per inch of mill length under these conditions is more nearly representative of its power consumption. This behavior gives an idea of the toughness of the resins of this type.

It is also interesting to compare the physical properties of a Plioform resin with those of a first-grade rubber tread stock. Assuming that both have an ultimate tensile strength of 5,000 pounds per square inch, the stress-strain curve of the 2, of course, is vastly different. Tread stock will possess an elongation of some 500 or 600% before reaching its breaking point; while the Plioform stock possesses practically no elongation.

Plioform has better resistance to acid than hard rubber. In making this test bars of Plioform and hard rubber (specific gravity, 1.29) were made 0.5 by 0.5 by 2 inches in size and were immersed in various concentrations in nitric acid. Twenty-four hours' immersion in nitric acid of 43% concentration had no effect upon the Plioform bar, but had caused the hard rubber bar to soften and distort to approximately twice its original dimensions. Increasing concentrations of acid further brought out this difference. At 58% there was some effect upon the surface of the Plioform bar in that it was slightly discolored, but there was no evidence of action by acid on the resin. Nitric acid of 65% concentration showed slight action and considerable discoloration; while the commercial concentrated nitric acid showed a pitting action on the surface of the Plioform bar. These tests may not be of practical value because the authors are not, as yet, ready to recommend the use of Plioform in 50% concentrated nitric acid, but the results of the tests show the decided difference in behavior between Plioform and hard rubber under these severe conditions.

Another interesting comparison of Plioform with hard rubber was in cold flow. The allowable limit on hard rubber for electrical purposes, as measured by one large telephone company's laboratories, is 0.001-inch per half inch length under 2,000 pounds' pressure per square inch with the test piece at 120° F. for 24 hours. Under these test conditions Plioform No. 40 possesses a cold flow of 0.00035-inch per inch—a 200% factor of safety over hard rubber.

It has long been the hope of rubber men to produce a colored hard rubber. These resins seem to be the answer to this ambition. Although they contain no sulphur or sulphur-bearing ingredients, they might well be taken for hard rubber in so far as their behavior is concerned in a number of applications. They differ from hard rubber in that they are thermoplastic and that a wide range of colors is available; the resin possesses slight limiting effect upon the color possibilities. Its light amber color can be utilized in compounding and formulating a large number of delicate shades in transparent, translucent, pearlescent, and opaque colors.

Another property in which Plioform resins resemble rubber is their behavior in solution. It is well known that by milling crude rubber the solution viscosity of the rubber is reduced. For example, a rubber cement containing one pound of unmilled rubber per gallon is much thicker and more viscous than a rubber cement which contains one pound per gallon of thoroughly milled rubber. This behavior is just as true in the case of Plioform resins.

Considerable work has been done on using solutions of Plioform to impregnate fibers of various kinds. It has been found that milled, or even overmilled, Plioform will give high-concentration and low-viscosity solutions. These solutions also possess the interesting property of thorough impregnation of fibers. In fact in the usual concentrations such mixtures so thoroughly impregnate the fibers that an insufficient amount of resin remains on the surface to laminate piles of fabric successfully, for example. It is just as true that unmilled Plioform solutions do not impregnate particularly well, but do thoroughly cover the surface of any material that is treated with them. Therefore for impregnation work the most desirable method is to use milled or overmilled resin for the first dip and to follow this immediately by passing the material through a solution of unmilled resin. This process gives thorough impregnation of fibers and sufficient resin on the surface to accomplish an excellent method of fiber covering. Sheets so prepared can then be stacked, one on top of the other, and molded in the manner common to thermoplastic materials, to obtain a laminated sheet of the desired thickness.

Laminated Sheets

A large number of highly decorative panels has been prepared in this manner. Aside from the decorative purpose it would seem that these panels should be of considerable interest commercially because of their low moisture absorption and their ability to stand up in acid and alkaline solutions. The regular A.S.T.M. test consists of utilizing a slab of laminated material one inch by 3 inches in diameter, filing the edges of this slab, and immersing it in water for a given period of time. A comparison of this sort made on a 4-ply, 8-ounce, fabric-laminated strip of Plioform shows approximately 1% moisture absorption in 24 hours of immersion, as compared with a corresponding phenolic laminated strip which possesses a moisture absorption of over 4%.

Another interesting application of these materials utilizes the laminated fabric in connection with the regular molding powder. If the pearlescent molding powders are used in conjunction with the impregnated fabric, some striking effects can be obtained. In this operation the fabric is impregnated in the usual manner and molded, using properly granulated powder in equal amounts on both sides of the fabric. This composite mixture is then pressed and cooled. The resulting sheets possess a pleasing finish in that they have a decided depth of surface and luster.

Pearlescent Colors

The pearlescent materials offer a wide range of possibilities in so far as the appearance of molded Plioform articles is concerned. It has been found that the particle size of the molding powder has a decided effect, small granulations giving the appearance of a fine grain effect to the finished article; while large granulations increase the size of this grain effect and tend to break up the uniform appearance of the surface of the article. These conditions, of course, can be operated in either extreme or by using a mixture of 2 granulations so that a wide

range of effects is obtainable. Then, in addition to the granular size of the molding powder the temperature at which the powder is molded imparts a distinct effect to the finished article. At higher temperatures the pearlescent material smooths out and becomes almost uniformly colored, each particle losing its identity, and the article takes on a pleasing metallic sheen. If the same powder is molded at low temperatures, each individual particle will stand out although the surface of the article will be perfectly smooth.

Another variation of this condition is brought about by a temperature differential in the mold itself; that is, if the mold has a hot or cold spot, a pleasing differential in the surface appearance is caused by this difference in temperature which exists in the mold. The configuration of the mold also has considerable effect on the surface appearance. Simple molds tend toward uniformity of appearance; while complex molds tend toward some quite complex patterns, owing to the manner in which the material flows during the molding operation.

Physical Properties

In the following table are given a number of determinations on the physical properties of Plioform:

Specific gravity	1.06
Odor	None
Taste	None
Softening point, ° F.:	
No. 20 Plioform	220
No. 40 Plioform	175–195
Cold flow,* in. per in. of length	0.00035
Molding temp., ° F.:	
No. 20 Plioform	310
No. 40 Plioform	260
Coefficient of thermal expansion	0.00008
Mold shrinkage (in. per in.)	0.0035
Resistance to discoloration by light	Good
Surface resistivity (ohms per linear in.):	
At 90% relative humidity	1×10^{11}
At 75% relative humidity	1×10^{12}
Tensile strength, lb./sq. in.	4,000–5,000
Compressive strength, lb./sq. in.	8,500–11,000
Flexural strength, lb./sq. in.	7,000–9,000
Impact strength (izod notched), $\frac{\text{ft.-lb.}}{\text{width} \times \text{thickness}^2}$	2.5–6.2
Water absorption (24-hr. immersion), %	0.03
Resistance to concd. acid	Good†
Resistance to strong alkali	Good

* At 2,000 pounds per square inch pressure and 120° F.
† Except strong nitric and strong sulphuric.

Molding Plioform Resins

At present Plioform resins are available as molding powders and in the form of rods and tubes.

The mold equipment required can be either the positive, semi-positive, or flash type of molds, but particular attention should be given to mold design so as to secure uniform conditions during the heating and cooling cycle. A temperature high enough to obtain satisfactory flow conditions in the mold is required. The No. 40 Plioform requires between 260° and 280° F.; while No. 20 should require approximately 310° F. After the mold has closed, cold water is turned through the channels, which were previously heated with steam, and the temperature of the casting is dropped approximately 100° F. The mold can then be opened without danger of warpage, and the piece removed therefrom.

As is common with other plastics, it has been found that when Plioform follows other materials in the mold, there is a tendency toward sticking and a slight gumminess of the surface. This can be overcome by using a 2 to 5% solution of a water-soluble soap. This mold solution is applied to the hot surface of the mold; then this surface is thoroughly wiped before the molding powder is introduced into the cavity of the mold. In complicated dies this soap solution can also be used as a lubricant.

Being rubber derivatives, these resins are inherently insoluble in acetone, alcohol, ether, and the like, but are dissolved by solvents of the petroleum or benzene type. However, if the finished molded article is given a 5- to 10-minute immersion period in an approximately saturated solution of chlorine water, the surface is then unaffected by gasoline and is somewhat resistant to benzene. This action is apparently either an oxidation or chlorination of the surface and is only a surface condition. The treatment, however, is satisfactory to overcome casual contact with these solvents.

Experience has shown that almost any type of well-finished mold can be used with these resins without detriment. The authors recommend, however, that the molds be steel, and it has been their experience that a polished chromium-plated mold gives an excellent surface finish to the molded article.

Finishing Molded Articles

In finishing molded articles there is one important consideration that should not be overlooked. All finishing operations should be carried out so that the resin is maintained under its softening temperature. To accomplish this, grinding and buffing can be successfully carried out by using water as a cooling and lubricating medium. In the grinding operation wheels of 60 grit or finer should be used; while in the buffing operation fairly stiff cloth wheels are practical. The surface speed of such a wheel should be between 1,500 and 4,500 feet per minute, and rouge may be used as an abrasive, preferably in the form of sticks such as Climax rouge. A fine spray of water is played on the wheel during the polishing operation, and under these conditions Plioform articles can be given a high and satisfactory polish. If the wheel is not cool enough or if too much pressure is applied during the buffing operation, there is danger of burning the surface and destroying the smooth finish imparted by the mold.

Para-Graphs

HOSE CROSS WRAPPERS. Previous to vulcanization rubber hose is spirally cross-wrapped upon the mandrel to consolidate its construction and give it size and finish. Sheeting torn into strips is the usual material for spiral wrappers, but this, as rubber workers well know, is unsatisfactory and uneconomical. Fortunately these defects can be obviated by substituting specially made loop-edge wrapping and vulcanizing tapes. These are made in plain and herringbone weave of various widths and ample strength to prove economical in service.

RECLAIM PROCESS. The vulcanized rubber is heated to about 130° either in suitable vessels or directly on the rolls. A plastic, homogeneous mass is obtained which can be vulcanized again and used for all kinds of rubber goods. The simplicity of the method, it is claimed, enables every factory to work up its own waste at low cost.

ADHESIVE PLASTER. Ordinary adhesive plaster with the center cut out and covered with a thin, transparent, and elastic rubber film forms a new kind of cover for wounds, pimples, abscesses, etc., eliminating clumsy bandages. Compresses or medicaments can be used under the plaster and are thus kept in the necessary sanitary condition.

ELASTIC THREADS. Rubber filaments produced in any known manner are coated and ornamented by a process which comprises rendering the surface of the threads adhesive and then applying a surface coating thereto. The coated filaments may be subsequently covered by winding with silk, cotton, etc.

Wire and Cable Stocks

Evolution of Rubber Insulation Compounds

F. B. Wilson [1]

IN THE secretive era previous to the time when the Joint Rubber Insulation Committee brought out its 1917 report, rubber insulation stocks or compounds were made by mixing with rubber an array of substances each present to perform some real or imaginary function in the estimation of the man responsible for the making of these stocks. A typical formula follows:

	Lbs.
Para rubber	33
Talc	16
Ozokerite	3
Zinc oxide	18
Litharge	3
Sublimed white lead	9
Whiting	3
Asbestine	3
Magnesia (light)	1
Mica flour	11
Sulphur	1¾
	101¾

Cheaper or lower grade modifications were produced by using less Para and increasing the quantities of mineral powders or by using the cheaper African rubbers, reclaims, or factice-asphalt mixtures for more or less of the high grade Para rubber.

Ozokerite at one time was considered an essential ingredient in a high grade stock, but when the demand made the price prohibitive, its place was taken by paraffine. Blown asphalt mixtures or mineral rubbers were substituted for a portion of the mineral ingredients with advantages of lower volume costs in many cases; and when the clean smoked sheet rubber of the plantation became available, the Para was displaced more or less in the insulation mixtures because the resulting physical and electrical properties of the insulations were practically as good as formerly and also because the tedious washing and drying operations necessary in preparing Para could be omitted with the plantation material.

Experiences showed that some of various insulations produced were good and that others did not give lasting service. The chemist with the methods of analysis available was helpless when attempting to unravel such complex mixtures; so there was no short method for detecting good products.

Consequently the next step in the evolution of suitable insulation stocks was restrictive in character. Representatives of users and makers of rubber-covered wires and cables agreed to standardize on a type of insulation that extended use had shown to be fairly satisfactory and which was capable of being readily checked chemically for conformity with the specified requirements. One formula for this type of rubber insulation is:

	Lbs.
High grade Hevea rubber	32
Whiting	23
Zinc oxide	36
Litharge	5
Sulphur	2
Paraffine	2
	100

[1] Chemist, Triangle Conduit & Cable Co., Glendale, N. Y.

The chemical type of specification widely utilized at this time had such narrow limits that the manufacturer had to adhere very closely to the above formula and do his best to make a good job of mixing, insulating, and vulcanizing the product.

Meanwhile similar order was established by the National Board of Fire Underwriters in the field of code or nominally 20% rubber insulation mixtures.

Concurrently another development was proceeding. Rubber technologists were showing that the use of the recently discovered organic accelerators of vulcanization and the organic aging retarders or antioxidants were capable of producing some very remarkable rubber stocks. Naturally it was considered desirable to adapt these results to wire insulation stocks.

In this present-day stage of the evolution of rubber insulations 3 methods have been followed in utilizing these new organic materials. One mode of procedure starting with some form of Hevea latex makes possible the mixing of various ingredients with an extra-rapid type of accelerator without danger of premature vulcanization. Another way of getting results involves the use of a fast accelerator in carefully controlled mixing and insulating operations followed by a continuous vulcanizing process. The last and more usual process, since it does not involve new or special mechanical equipment, has to do with simply carefully controlling the heat development during the conventional dry mixing operation on these low-sulphur stocks so as not to cause the accelerator to act too soon. The type of accelerator used in these super-aging stocks should be one capable of yielding some of its sulphur when the proper vulcanizing temperature is reached. The following example of this kind of stock is suggested by the du Pont organization:

	Lbs.	Ozs.
Rubber	26	–
10% Thionex masterbatch	3	2
10% Tetrone A masterbatch	2	6
Zinc oxide	36	–
Whiting	30	14
Paraffine	–	8
Neozone D	–	10
Lead oleate	–	8

These new products have entailed an output of new specifications of the performance class in which the older chemical clauses are greatly reduced or totally absent and in which emphasis is placed on the electrical and aging qualities of the insulation. These changes are in the right direction because, in the last analysis, a user of electrical wires and cables should not be unduly concerned about the makeup of a stock so long as the product has good aging and electrical properties.

If a conservative course is followed, there will now be a lull or data gathering period so that a firm relation between the behavior of these new super-aging stocks in the high oxygen concentration of the bomb test and under conditions of electrical stresses in actual service may be established.

Paced Production in Footwear Manufacture

David Phillips

NOT so very many years ago the term "Paced Production" was coined to cover a new type of advanced manufacturing method. Perhaps the origin of the term may be traced to the old-time foreman who frequently merited the title of "human persuader" as he has for a long time in our manufacturing history been a human pacemaker for those over whom he is in authority.

To those who have become conveyer minded in the newer industries and who have never experienced old-time manufacturing methods it will be difficult to visualize the antiquated process in which most rubber footwear manufacturers found themselves involved back in the post-war period. Orders for goods at the end of the World War were about as plentiful as salary and wage cuts have been since the depression. Anyone with an apology for a mill room could sheet out gum uppers and outsoles and after assembling under what today would be known as "sweat shop" conditions could easily dispose of his product. Profits were the rule, not the exception.

To picture further the post-war boom period one must realize that plant facilities had become congested by reason of the volume experienced during the war and that many of the larger corporations had bought the control in smaller competitors to gain greater profits through centralized purchasing and other functional activities.

"Paced Production" was unheard of in rubber. It had always been an accepted fact that a raw material the plastic nature of which made handling so very difficult would not lend itself to large-scale, high-speed production. Everyone had the impression that manufacturing could not be done in a big way, and as a result for many years the individual shoemaker at his bench comprised within himself practically a small manufacturing plant. Each operator did his own fitting, cementing, lasting, uppering, outsole placing, and rolling of parts; in fact, doing almost every making operation except calendering, preliminary fitting, varnishing, and vulcanizing.

Picture to yourself, back in the war boom, a footwear plant employing perhaps 3,000 workers. The factory proper was probably divided into its major departments about as follows:

Compounding and Mill Room	Varnishing
Cutting Department	Vulcanizing or Heater Room
Fitting and Making	Packing Department
Shipping	

Compounds and Mill Room

Compounding and mill room work was generally carried on in adjoining rooms so that conveying was a simple matter of hand trucking between compound bins and the mixing mills.

Outsoling, rags, and upper stocks, on the other hand, even then were moved by modern methods. They were generally conveyed on flat canvas belts directly from the calenders to a room on a floor above where they were taken off on frames or reels. The stock was then machine or hand cut, using flat metal patterns, beam presses with dies, or by other means.

The modern mill room has profited by acquiring additional equipment rather than by eliminating its old-time machinery. The development of the enclosed mixer, for example, and its possibilities for bringing compounding and mixing closer together with elimination of floor space is a veritable pacemaker; it requires conveying equipment, which although frequently of the gravity type, nevertheless gives the worker a means of moving compound boxes and milled stock along to their mixing station. To the worker this can only mean stimulation and increased production because of the ease with which such loads can be moved.

The Cutting Room

The cutting room as a rule consisted of mallet and die cutting on wooden or composition blocks. Here and there one found operators with knives cutting around flat metal patterns pressed down on to the gum sheets, who used the highly skilled backhand stroke to enable them to cut the proper bevel where needed, should the work be outsoles. Engraved uppers were cut on zinc tables with hand knives as a rule, and the scrap picked in like manner. Semi-automatic cutting machines were being used for outsole cutting in general, but there were always special bevel requirements calling for hand work.

All material ready for cutting lay on long, wooden, canvas-covered frames or in books or reels; sometimes piles of these frames reached almost to the ceiling. When a bracket of uppers was to be made up, a bench cutter often called to his neighbor from his block, and both left their work to carry the loaded frame to a position near the cutting bench. The sheet of stock was carefully lifted off the frame and laid over a long table top whence the cutter could draw it toward himself as the material became used. Some plants utilized reels at this operation, and in such cases the worker had to unwind the loaded reel and take care of the empty ones as the cutting proceeded.

Today all is changed. Many manufacturers have been able practically to eliminate hand cutting of many parts through improved mechanisms for calender cutting. Uppers and tennis trim can be machine cut while run off the calender; a feat believed impossible back in the war period. Canvas belts acting as pacemakers convey these cut parts to the various departments where they are picked and booked ready for servicing the actual shoe assembling machines. Outsole stock is cut to length automatically as it leaves the calender and is laid away in frames until required for cutting into soles with the sole cutting machines. Such modernized machines when

efficiently used, whether for outsoles, uppers, or other gum parts, have a pre-determined daily capacity of output and are pacing the worker to turn out maximum production. Motor driven, at a fixed number of possible cuts per time unit, they pace the worker and demand that he in turn show a satisfactory efficiency at the end of the day.

Contrasting a hand cutter with a machine capable of turning out thousands of cut units daily, one readily sees that the machine will show up poor quality or low output quicker perhaps than is visible in the hand operation. To be sure, the skill and dexterity of any group of workers varies even when machine tending, but to no such degree as one finds in a group which use hand methods 100%. Instead of a great number of workers to supervise for a cutting operation, one has only to oversee the work of a comparative few because of the greater output per person.

Team Work and Layout Methods

When orders began to slacken after the war boom had subsided, questions of cost again became paramount. Industrial engineers, foremen, superintendents, and every one who felt responsibility to the management tried to devise ways to produce footwear at a much cheaper figure than heretofore. It was obvious that the bench method which produced perhaps 30 or more pairs per person for some types of footwear must be eliminated and replaced by something new that would increase the individual's daily output.

One or 2 of the larger companies went in for squad workers who comprised a group of highly skilled operators capable of performing any making job on team work. The assembly operations for a boot or shoe were in some cases so broken down into elements that 4 or more operators with benches arranged for convenience in adjoining positions might make a complete article of footwear. Squad workers were used to fill in when absenteeism or other difficulties interfered with production and made additional help necessary at very short notice. Each man on team work acted as a hand conveyer and passed the completed minor assemblies along to his team mate when finished and so on around the clustered benches comprising the unit, until the article was ready for the varnish room and heater car.

Team work, as this method was known, was a crude but effective beginning for the pacemaker era. Its limited success led those with foresight to vision even greater cost reductions if the idea could be carried out on a more advanced plane.

Another experiment in breaking away from the apron strings of traditional footwear manufacture was made on layout or flat assembling. Noting the success of other industries in joining sub or minor assemblies of their product by using the flat-belt type of conveyer with operators located alongside at various stations, attempts were made to break down footwear making operations in a similar manner. Constructions were necessarily changed to meet the requirements of this idea in manufacturing, and the public was asked to buy an article which had a slightly altered appearance, but which many old-time rubber men felt did not sacrifice any of its former wearing qualities.

The Rack System

The next forward step toward more efficient assembling of footwear came with the so-called rack method. This scheme in manufacturing, borrowed from the leather shoe industry, was not in itself new, but it had not been used very much outside of the leather shoe business. In brief it consisted of utilizing small, portable shoe trucks of light construction which contained as many unit parts as possible for making up a 24- or 48-pair lot of shoes. Operations were broken down into elements so that the rack with its load of elementary and sub-assemblies, after being pushed along from worker to worker located at unit machines or making tables, finally reached the end of its journey. Its load of assembled shoes then was transferred to a vulcanizer car, and the empty rack returned to the head of the assembly line where it was stocked for another cycle.

Rubber footwear plants all over the country became sold on the rack system, and equipment vendors found it very easy to dispose of small, caster-mounted racks, the design of which had been patterned after those in use in the closely allied leather industry. Their construction had to be altered to meet the special conditions required for handling a plastic material, and storage places for rubber shoe parts were added; however, fundamentally, it was the same rack.

Manufacturers who had to plan for this step toward the present high paced production methods actually had to clean house. The individual bench worker's tables were slowly and systematically torn down to give floor space for the rack trucks, and the workers themselves had to be trained to do one or more elementary operations at an assigned station in the ultimate plan of synchronized manufacturing. The net gain resulting from this forward step cannot be accurately measured; however there is no question but that it gave the employer many distinct advantages over the old-time process. Perhaps its greatest asset was flexibility. A new worker could be trained for one or 2 making operations with comparative ease as contrasted to teaching him complete shoemaking technique with all its detail and complication. How much easier it was to train a worker simply to place rubber trim around a toe or to set an outsole than to instruct a novice in joining linings, lasting, cementing parts, rubber trim placing, friction and rag locating, uppering, and other tricky details.

Another big improvement which resulted from the introduction of this method was the tendency to eliminate congestion. Fire hazards in the old-time footwear plants were frightful, and by eliminating the worker's benches, generally along each side of small blind alleys running off the main aisles, a step in the right direction was certainly made.

Modern Pacemaking

The rack system in rubber footwear making has been relegated to the museum of antiquated manufacturing exhibits. Its place has been taken by the modern manufacturing machine which in most industries is basically the assembly line or conveyer.

At the time when footwear was still being made by the individual maker, the public imagination was stirred by tales of almost unbelievable manufacturing efficiency which a well-known producer of low priced motor cars had obtained. Completed automobiles, painted, adjusted, and ready to run, emerged from the end of a chain conveyer line! Exactly so many per hour could be expected, and so precisely assembled were these completed motor car units that one merely snapped the switch and drove them off under their own power! Men stationed alongside the moving chain conveyer at carefully studied intervals had step by step added their bit to the moving structure which was to become a motor car at the end of its journey down the assembly room.

Modern footwear manufacture presents almost as fascinating a picture. To one who has had the privilege

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Inexpensive Rubber Goods

Woolworth's Great Assortment of Rubber Merchandise to Fill Every Need

THE rubber industry certainly owes a vote of thanks to the founder of the Woolworth chain, for he created a profitable and far-reaching market for innumerable rubber products cheap in price only. A stroll through these stores reveals rubber in some form at nearly every counter. It would be practically impossible to list each item wholly or partly of rubber found there, but a brief description of some best-sellers will show how diversified are the rubber goods featured.

Let us start with rubber for the home, beginning with the kitchen. What does Woolworth's hold for the housewife? Colored rubber gloves will keep her hands soft and white. To shield her clothes from splashing water, etc., are rubber aprons in many colors and designs. To protect her knees she'll want a sponge rubber kneeling pad. This has several uses around the house and in the garden. Besides it can serve as a comfort seat on boats and at ball games, picnics, and beaches. Also shown are floor mats in various sizes, shapes, and hues.

Dishwashing calls for ridged drainboard mats in colors to harmonize with the kitchen furnishings. Plate scrapers are available in several models. Two have handle and scraper of one piece of rubber, somewhat bell-shaped. A white rubber scraper with colored wooden handle is of novel wedge shape with an oval cut-out.

To scour pots and pans steel wool is recommended. Because it is painful to sensitive fingers, rubber holders were created. In one a flexible rubber circle tops the steel wool, all held together by a wooden knob. Another rubber holder is box-shaped. Still another consists of perforated rubber encasing the cleaner, the whole cylindrical. As the scourer wears down, a circlet of rubber is peeled off.

Sink stoppers also come in several sizes, colors, and styles. One, 3½ inches across, for the new type of kitchen sink flaunts a heavy reenforced rim that checks curling and warping. A knob on the outside rim breaks the suction; while a knob in the center underneath prevents slipping. Other knobbed stoppers with a ring for lifting are 4⅝ and 5 inches in diameter. An interesting item is the combination soap dish and sink stopper 4¾ inches across with a depression in the center for soap.

White rubber corks are useful. So are improved bottle stoppers. One, of red rubber, comprises threaded cork and extra rim that folds over to cap the bottle.

Every one knows the rubber jar rings sold by Woolworth for sealing preserves, etc. Yet how many customers are acquainted with that blessing in disguise, the jar opener? One grip, a band of red rubber, has a pimpled inside that fits around the jar top. Then the user, with a firm hold on the device, merely turns it—and the jar is opened. A different model, cap-shaped with a large hole in the center, is ridged inside and out. These grippers, incidentally, are also used to seal containers tighter.

Two kinds of rubber fly swatters are on hand: one with swatter of perforated rubber; the other of narrow rubber switches.

Large colored sponges are ideal for cleaning walls, windows, furniture, etc. Window wipers use rubber. Several styles can be procured. One has a colored wooden and metal handle embracing a 6-inch rubber wiper. Another sports a metal holder for its 12-inch rubber strip.

To prevent marring and scratching polished surfaces rubber is commandeered in many guises. Included in this group are table, chair, and crutch tips and cups; casters; and coasters for glasses. Rubber doilies feature a dainty white lace pattern on a colored background.

Rattling noises will drive any one to despair. Once again rubber comes to the rescue. Tiny maroon or white wedges stop rattling in doors and windows of homes and automobiles. Large triangular pieces of rubber with saw-tooth edge also will check jittery doors.

A rubber bulb with a perforated metal spray is used to sprinkle clothes and plants. For garden hose come red rubber washers ½- and ¾-inch in size.

Wide rubber rings with ridged insides keep candles from wobbling out of their sticks. While a narrow rubber ring holds the ribs of an umbrella closed.

Mats for floor and bathtub appear in several shapes and designs. Ridged or embossed mats with aquatic motifs are popular. Sizes range from 24½ by 14½ inches to 27½ by 13½ and 27¾ by 18 inches. Shades include any tone to match the color scheme of the bathroom.

Five-foot lengths of tubing for syphon purposes and many other home uses are obtainable. Complete foun-

tain syringe fittings and tubing likewise are available; so are bulbs and atomizers and colored spray and tubing attachments and spray ends. You can even buy a hot water bottle in this store. Then, too, adhesive plaster sells in several widths. Even more useful is the combination tape and bandage.

As for rubber beauty aids their name is legion. There are sponge rubber powder puffs and bath sponges in several sizes and colors, also rubber nail and hand brushes and rubber face patters and other massagers including a sponge rubber mitten. Another all-rubber product folds over the hand and snaps on the back, leaving the brush part on the palm. This article also invigorates and cleanses the skin while stimulating circulation. It too is fashioned in popular colors.

No remarks about kitchen or bathroom would be all-inclusive without some reference to rubber for plumbing. Black beveled faucet washers with screws will stop hot or cold water leaks; while fuller balls to repair leaking faucets are offered in 4 sizes complete with metal cap. Faucet filterers and dish protectors now are designed also for the new style of kitchen sink. The white basin and tub stoppers run in size from one inch to 1⅝ inches. Besides appear black rubber tank balls and rubber plungers on wooden handles. To protect the finish of toilet seats are suggested rubber bumpers.

Rubber for the nursery next attracts attention. Pink rubber baby pants in small, medium, and large sizes have white linings. Explicit directions for their care are given. So too for the crib sheets 24 by 36 inches in pink, white, natural, and maroon. Want any nipples and pacifiers? Another interesting item is the sponge rubber nurser cover which keeps the food warm and prevents the bottle from slipping out of tiny hands and breaking.

Mention of the nursery brings thoughts of rubber toys. There are so many; we don't know where to begin. Just look at that pile of rubber balls, hard, soft, and sponge, in several sizes in a riot of color, some with figures in relief. The balloons too are pleasing in their gay patterns. Many have squawker attachments. Aren't the rubber dolls adorable with features in natural colors? Some squeak when squeezed. Next are the soft rubber animals, several of which squeal. Inflatable toys also are on the counters; while all sorts of sponge rubber playthings likewise lure many purchasers. Rubber rings, balls, and bones for dogs have a ready sale.

For personal wear are displayed a host of rubber goods. Garters, for instance. Long, round, flat, narrow, wide, in all colors, some exceedingly plain, some very fancy, for men, women, and children. Should you prefer to make your own belts, garters, etc., millions of yards of elastic webbing are at your disposal. Dainty garter belts and elastic shoulder straps that are adjustable, washable, and detachable, also add to milady's appearance. Rubberized and all-rubber dress shields can be had in several sizes, colors, and weights. Sanitary goods, also, utilize rubber considerably. Then, elastic ankle supports and bandages and metatarsal pads will aid in foot comfort.

Speaking of feet—how about your shoes? Do they need new soles and heels? If so, be your own shoemaker. Black rubber soles with clever tread designs can be put on with the rubber cement also attached to the card giving instructions for the repair job. Rubber heels are either cemented or nailed on. One very practical set comprises rubber heels, tube of cement, and rubber worn spot filler to be applied to the crooked part of the heel, making it even before putting on the new rubber lift. Another footwear specialty is the women's emergency rainwear set consisting of small rubber bag containing 2 half-sandals that slip on either shoe; or the heelless, lightweight snapon galoshes for unexpected snowstorms.

You can also secure many rubber accessories for the seashore. Serviceable beach sandals and slippers are offered in all popular shades and sizes. The variety of bathing caps will suit every requirement. Diver, aviator, and fancy models in a wide range of colors and trims await you. Bathing suit belts and short rubber capes also are made in fashionable tints. To carry bathing outfits are rubberized bags with terrycloth linings. These bags, cylindrical in shape, have a self-material strap and snap fasteners. Besides you'll want one of those large inflated brilliantly colored beach balls.

The Woolworth Co. sells innumerable other rubber products as covered in the following miscellaneous array: stair treads; tubing in various colors, corrugated, round, hexagonal, octagonal; electricians' tape; rubber-head tacks and screws; insulated wire; auto mats; fender flaps; battery fillers; erasers; rubber bands; finger cots; rubber cements; hard and sponge rubber soap dishes; combs; seat cushions; rubberized icing bags and wash-cloth cases—Oh! There are so many more; but you've had enough.

A point in passing: the predominating color in the samples displayed was green. Another interesting fact—and one that will be publicized and utilized more and more as manufacturers realize the profitable sales appeal in the practice—is that some goods were of scented rubber.

Improved Bias Cutter and Take-Off. This machine is combined with an apparatus that receives the cut fabric and permits the bias pieces to be handled for splicing into continuous lengths. Changes in spacing of the cuts can be easily and quickly made at the convenience of the operator and without stopping the machine. The mechanism for taking off the bias cut strips is driven independently of the cutting mechanism. A control mechanism for synchronizing the take-off mechanism relative to the cutting mechanism is operable and controlled by a light touch of the fold of the fabric between cutting and take-off mechanisms.

Dipped Goods from Latex Solutions

George D. Kratz

A DESCRIPTION of some of the different methods now employed in the manufacture of dipped goods from latex solutions may be readily written. The application of these processes, that is their practical utilization, involves acquiring a certain amount of technique which cannot be obtained from the printed page. Actual experience in handling latex solutions is not only necessary, but absolutely essential for best results. Once this experience has been gained latex solutions may be easily and economically substituted for rubber cements or solutions of a similar type.

There is a very definite reason for this. Latex consists of a dispersion of negatively charged particles of rubber in water. As a sensitive colloidal solution, it reacts readily to physical, chemical, and electrical changes. Coagulation may be effected by any of these means and sometimes, from a practical standpoint, with disastrous results. There is little utility for the rubber of such coagulums if coagulation is premature. Naturally latex solutions are exceedingly sensitive to all types of electrolytes. To a certain extent this tendency may be decreased by putting a protective colloid in the solution. The result, however, is to minimize the effect rather than entirely to prevent it. Among the substances generally used for this purpose are casein, dextrine, agar-agar, gelatine, gum tragacanth, turkey red oil, Irish moss, haemoglobin, etc. Possibly casein is the most widely used and regarded as the most efficacious for general purposes.

Latex is now readily available in the normal or 38% concentration. For manufacturing dipped goods, though, it is very often advisable to employ higher concentrations. At present but 2 well-known brands of concentrated latex are on the market. One is Dunlop's 60%, obtained by centrifuging the 38% solution with the subsequent elimination of water. Many of the water soluble elements in the latex are said to be removed during the process which makes the concentrated latex very desirable for certain processes.

A product of even higher rubber content, known as Revertex, is also on the market. It has a solids content of approximately 70%, is said to contain the serum products not found in the Dunlop concentration, and is stabilized with protective colloids. Not having a strong ammoniacal odor as do most latices, Revertex also has very definite applications in manufacturing dipped goods.

Dipped goods prepared from latex solutions embrace a rather wide field including toy balloons, bathing caps, gloves, prophylactics, and even automobile inner tubes and tennis grips. The range is entirely too great to permit a detailed discussion of each item. Toy balloons have therefore been taken as an example of what might be called general procedure. But it should be borne in mind that balloons represent one of the simplest operations and do not involve the difficulties encountered with some more complicated articles, as surgeons' gloves.

The actual dipping is usually accomplished by simply immersing a wooden, glass, or porcelain form into a latex solution of the desired consistency, allowing the film to dry, and redipping until the required thickness has been built up. In other instances the form is first heated to the vulcanizing temperature before being dipped into the compounded latex solution.[1] On removal from the solution the heated form assists in drying the film. A number of patents have also been granted for first dipping the form into a coagulating bath, usually containing gelatine or a similar substance to retain the coagulating agent.

In another patent[2] the use of a porous form is advocated, the form absorbing the water or allowing it to permeate through the form with the consequent deposition of rubber. But in any case the operation is essentially the same, and the modifications mentioned are only a few of a wide variety of alterations that may be employed in the method of application.

Another method utilized in making a popular novelty consists in stamping out the desired design on absorbent cardboard. This form is simply dipped into the compounded latex solution, where the cardboard absorbs the water and leaves a rather heavy deposition of rubber on the surface. After drying and vulcanizing, the article is crushed together, and the disintegrated cardboard blown out with air.

The thickness of the film, about 0.010-inch for toy balloons, naturally depends on the solids content of the solution, which in turn largely regulates the viscosity of the solution. Since concentrated solutions contain a higher percentage of rubber, it may be generally stated that solutions of high viscosity require fewer dips for the desired thickness than do thinner solutions. It is for this reason that latices of 60% and 70% rubber content are of particular interest in dipped goods.

It is obvious that in effecting the incorporation of the different compounding ingredients, sulphur, and accelerators they must be highly divided for manufacturing balloons and similar articles subject to great distention while in use. Theoretically the different materials employed should be brought down to a state of division equal to the size of the rubber particle itself. While this division is not usually achieved in practice, it can be approximated by putting the different ingredients through any one of several types of colloid mills. Good results may also be obtained with a ball or pebble mill although the time element with a mill of this type is somewhat longer.

Naturally the type of solution used varies according to the article to be dipped. Entirely different kinds of solutions are used for surgeons' gloves and for toy balloons. For example, a representative solution for green toy balloons may have the following composition:

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[1] Hatfield, United States patent No. 1,635,576, July 12, 1927.

[2] Trowbridge, Dominion of Canada patent No. 284,565, Nov. 6, 1928.

	Lbs.		Lbs.
60% latex	176.0	Zimate	0.5
Sulphur	2.0	Antioxidant	1.0
Zinc oxide	3.0	Titanium oxide	10.0
#552	0.5	Green colorant	3.0

The above mixture may be prepared as follows. Sulphur, accelerators, pigments, color, and antioxidant are placed in a ball mill, with twice their total weight of water. Two ounces each of casein and gum arabic are added, and the mill allowed to operate for at least 24 hours, longer if possible. The charge is then dumped and stirred into the latex solution, with the usual precautions. The resultant solution will have a total solids content of between 50 and 55% and a relative viscosity (water=1) of about 2.0.

It is to be understood that the above mixture is cited simply to show the general character of the formulae for this type of work and is subject to wide variation depending on whether a coagulant is used on the forms, the composition of the form employed, etc. Some solutions, for example, will wet glass, but will not be evenly deposited on porcelain forms. In other instances quite the reverse is found to be the case. This condition may require the addition of such wetting agents as Aquarex, Igepon, Aresco, etc.

After the solution has been prepared, possibly the chief difficulty encountered in the factory is the prevention of creaming. From a practical standpoint creaming consists in either a gradual or sudden increase in viscosity. Very often in the case of compounded solutions it is accompanied by premature vulcanization. Temperature changes have a most marked effect; so constant control is necessary to maintain the desired viscosity. The tendency toward creaming and "setting up" is much worse in hot weather than in cold; consequently many plants have jacketed their dipping tanks so that constant temperatures may be maintained at all times. The viscosity of the solution is also somewhat dependent upon the humidity, but the general tendency is toward the humid side for best results. This has the added advantage of decreasing surface film formation.

The maintenance of uniform viscosity in latex solutions cannot be too strongly stressed. Naturally the thickness of the deposited film varies with the consistency of this solution. Further, a solution that has once started to cream will not always show the same properties even if diluted to its original viscosity. It is also dangerous to attempt to thicken a thin solution with gums, colloidal clays, etc.

Other viscosity changes result if, while being mixed or used, the solution is subjected to friction from agitators. To overcome this difficulty many ingenious devices have been developed, chiefly combinations of circulatory pumps and baffle plates. This procedure eliminates any possibility of scraping by an agitator and through gentle circulation decreases the tendency to cream on the surface and to a certain extent prevents film formation.

Vulcanization of latex dipped goods may be accomplished either in hot water or hot air. In most instances hot water is favored as its temperature may be more readily controlled, and the time of vulcanization is somewhat shorter. A solution of the type given, for example, will vulcanize in about 12 minutes in water at 100° C. and requires about 18 minutes in air at the same temperature. Another advantage of hot water is that, if desired, it permits the solution of some of the components of the mixture in the water. Several water soluble ultra-accelerators now are available, and some manufacturers prefer to omit the accelerator from the original mixture and dissolve it in the vulcanizing bath. When curing in hot air, all the constituents must be included in the original solution unless gases are employed in the vulcanizing cabinet. The latter procedure, somewhat troublesome, is not generally employed.

Under proper conditions latex has decided advantages over rubber cements for most purposes in making dipped goods. Being a water emulsion, its use involves no fire risk, and it may be employed in any type of building. It is also workable at a much higher solids content than rubber cements. A latex solution containing 60% solids has a viscosity less than a normal 10% rubber solution in naphtha. This permits a greater deposition of solids with a lesser number of dips.

The vulcanization of latex depositions either in hot air or hot water is also a distinct improvement over the old cold-cure method. Not only is the objectionable sulphur chloride eliminated, but the final product is far stronger and ages infinitely better than a similar item made from rubber cements. For example, a toy balloon made as described will have a tensile strength of approximately 4,000 pounds per square inch, an elongation of 900%, and will age well for a period of years.

From a cost standpoint latex has both advantages and disadvantages as compared to rubber cements. Generally speaking, however, the advantages outweigh the disadvantages by decreasing fire insurance, and eliminating expensive solvent recovery processes and the cold-cure process.

Summarizing briefly, it would appear that notwithstanding any present difficulties encountered in the use and the application of latex solutions, they will eventually supplant rubber cements for most dipping processes. With latex solutions the manufacturer eliminates the purchase of heavy masticating machinery, fire risk, solvent recovery, sulphur chloride, and a number of other features which are not only objectionable in use but also expensive in operation. Besides he is able to produce a finished product far superior in physical properties to a similar article made from rubber cement.

Paced Production

(Continued from page 30)

of inspecting an up-to-date plant the outstanding accomplishment in recent years is most certainly the abolition of former methods in deference to pacemaking assembling on jigs or fixtures fastened to a moving chain. Its advantages to both manufacturer and consumer are many. Fixtures make for accuracy with resultant interchangeability of parts, and the possibilities it presents for a standardized article are innumerable. Each shoe is expected to meet certain quality requirements by the buyer, and if made by modern methods, it can be examined at every step in its assembly by the overseer or inspector. All parts are visible at all times during the process and can be compared to pre-determined standards of quality, both as to materials and workmanship.

Operators have developed remarkable skill and finger dexterity at their allotted tasks owing to the fact that they go through the same motions hour after hour and day after day while performing their contributing link in the assembly chain. The modern conveyer as a production machine is dependable; it runs at a fixed speed consistent with the skill needed on any particular style of footwear and, when figuring costs or production schedules to be met, it is a tangible tool, measurable in dollars and cents and a real yardstick by which production output can be very closely predicted.

The mechanical pacemaker has come to stay!

Rubber Printing Plates

Joseph Rossman, Ph.D.

THE following abstracts of United States patents conclude the interesting and informative article on rubber printing, plates from our February issue.

48. Edwards, 1,804,920, May 12, 1931. Printing plates having the impression parts thereof formed of rubber, linoleum, and kindred substances are in common use. They are considered advantageous, for instance, where relatively large tint areas are to be printed, one reason being that the resilience of these materials reduces the amount of make-ready necessary and enables an even tint readily to be printed. Another, and a growingly important, use of such printing plates is in connection with the process of printing by the so-called water-color inks, which is ordinarily carried on along the lines of patent No. 1,595,756. Printing plates having metallic surfaces are found not to accept readily these water-color inks, and plates having the impression portions formed of rubber, linoleum, etc., are commonly used.

In producing such a plate for the Jean Berté process, for instance, the operator is supplied with a key proof from which he takes an impression upon the rubber surface of a composite plate formed by cementing a rubber sheet upon a metallic base. With the impression as a guide, he then cuts away, with a knife or other suitable tool, all the face of the rubber except those portions from which the impression is to be taken. He often has to cut up the composite plate since different parts thereof will frequently be used for different colors. The result, for any one color of a color printing job, is usually a plurality of metallic plates each carrying in relief rubber a portion of the design to be printed. These plates, generally assembled on "patent bases," are adjusted in position on the latter until they occupy precisely the correct location for the design to register with another color. Evidently the time, labor, and skill necessary to produce such plates and set them up correctly in the form are very great and add considerably to the cost of work of this character.

An example of this invention follows. An ordinary zinc etching is made, having in relief the design to be impressed. The low parts of the etching are then coated with insulating material such as an insulating varnish. This work may conveniently be done by coating the whole plate with varnish and thereafter polishing the varnish away from the relief portions of the plate. After these portions are cleaned the plate is introduced in contact, in this instance with the anode, into a rubber emulsion in an electro-depositing bath of the general character disclosed in United States Patent No. 1,476,374 dealing with the electro-deposition of rubber coatings. Such bath may, if desired, contain the requisite elements for subsequent vulcanization of the rubber by the mere application of heat. The coating of rubber will be deposited only upon those parts of the zinc etching which are unprotected by the insulating varnish, that is to say, the relief parts corresponding to the design to be impressed, with the result that a plate is produced in which rubber portions corresponding to the design to be impressed stand in relief. When the plate has been thus produced, it is removed from the depositing bath, washed, and vulcanized.

49. Schmutz, 1,810,089, June 16, 1931. A method of producing a plate for printing on coarse fabrics, corrugated paper, wooden containers, etc., consists in forming a resilient impression material with a design having a metallic backing formed with transverse lateral flanges, treating the surface of the backing with a cleansing substance, applying a cementitious composition to the cleansed surface, covering the cementitious substance with a rubber material, interposing a fabric intermediate the rubber and impression sheets, and then homogeneously uniting the assembly by vulcanization.

50. Baker, 1,834,759, Dec. 1, 1931. Rubber printing plates or rubber faced plates have been used for many years for certain kinds of printing. However a more general use, particularly for fine art printing, has been prevented by certain difficulties which have imposed definite limitations. One of the most important of these limiting factors is that it has been impossible to obtain accurate alinement or registration when printing from such plates, owing to unavoidable variations between them and the dies or master plates. These are produced in various ways, such as by casting, etching, or engraving, and are true to the dimensions of the picture or design to be produced.

The variations between the rubber plates of the prior art and the master plates arise partly from the fact that the molds in which the rubber is formed to give the printing design do not expand at the same rate as the rubber in vulcanizing, and when the finished plates are removed from the vulcanizing mold and cooled, it is found that the rubber has shrunk so that the plates are smaller than the original and that the various elements of the design are out of their correct relative positions.

In prior manufactures the rubber plates have, after vulcanization, been mounted on metal or wooden plates so that they can be carried in a printing press. It has been appreciated that this attaching operation might be made a part of the vulcanizing operation, and that if the rubber plates could be vulcanized on metal backing plates, shrinking and other harmful variations from the master plates might largely be prevented. However in prior manufactures it has been found difficult to effect such vulcanization on the backing because of the nature of the molds employed and the methods of using them in manufacturing. While attempts have been made as indicated, they have, so far as known, been unsatisfactory because of the high percentage of defective plates.

According to this patent it has now been discovered how these difficulties can be overcome and an accurate undamaged plate produced which is vulcanized to a metal backing of sufficient stiffness to prevent any subsequent shrinking or displacement of the rubber.

Stated in general terms the new way of manufacturing such plates comprises the use of lead lined, special molds for the rubber forming and vulcanizing operations. Such a mold is produced by first copying in a sheet of lead the outline and surface configuration of a die or master

plate. In making the copy the sheet of lead is forced into and over the master plate by pressure.

So that the lead may faithfully receive all the details of the master plate, the pressure is applied by any suitable press through a pad of yielding material which is fibrous enough to prevent breaking the pad down too readily, but which will yield sufficiently to cause a satisfactory distribution of the pressure. A pad of dry paper pulp or one composed of sheets of newspaper is very satisfactory. Applying the pressure through such a pad forces the lead into all the details of the die or master plate, thereby effecting a very accurate embossing in the lead of all features of the picture or design. The pressure is then released and the pad removed, leaving the lead pressed into and around the master plate.

A backing is then applied which is rigid and which will hold the design in the lead after it is removed from the plate. For this purpose a material is used that can be poured over the lead sheet and master plate and which will set to a rigid form. A satisfactory material is a mixture of glycerine and litharge or a dental cement. Before starting the pouring operation the plate and the adhering sheet are laid on a flat surface, and after pouring and before the material has had time to set, a similar truly flat plate is used to force the material down until this second plate is arrested by stops provided for that purpose. They are of such height that sufficient backing material remains behind the lead to give ample rigidity at all points.

After the backing has set, the master plate with the attached rigid backing is removed from the supporting and pressure plates. The master plate is then removed, leaving a lead lined mold ready for use in molding and vulcanizing rubber plates. In practice this mold is not quite so deep as the thickness of the master plate. The lead lined mold is then placed between relatively movable plates of a vulcanizing press having their faces truly flat and parallel. Either before or after placing the mold in the press, it is supplied with a suitable plastic rubber compound containing the usual or any desired vulcanizing and similar agents, the quantity of the compound being in excess of that required for the finished plate.

A backing plate previously treated to cause adhesion of the rubber is then applied to the compound and the vulcanizing press operated to force that plate toward the mold. This action compacts the compound in all of the details of the lead lined mold and extrudes the excess rubber between the top of the mold and the backing plate. Stops between the relatively movable portions of the vulcanizing press arrest that movement at the point where the thickness through the rubber and backing plate is substantially the same as the thickness of the die or master plate used in making the mold. As a result, after vulcanization the finished rubber plate will be a metal back rubber reproduction of the master plate in dimensions and all other essential characteristics.

The metal backing plate is preferably of an alloy of lead and antimony. Such a material has the necessary rigidity to hold the rubber in position, but is nevertheless capable of being formed to offset irregularities or regulate the impression of the printing face. Such a metal or alloy presents difficulties in securing a good adhesion of the rubber and the backing plate, but if the face of the plate which engages the rubber is washed with a dilute solution containing copper sulphate and copper nitrate, a perfect adhesion will result from the molding and vulcanizing operation.

51. Simms, 1,849,598, Mar. 15, 1932. The process of making plates for use with water-color inks comprises covering the impression surface of a plate of the type used in printing oil-soluble inks with a thin facing of unvulcanized rubber, pressing a resilient cushion against the rubber facing to force it intimately around the edges of the printing surface of the plate to impose a surface skin thereon, and vulcanizing the surface skin.

A printing plate so produced will take any of the commonly used oil, alcohol, or water-soluble printing inks. When water-color inks are used, little pressure is needed to transfer the ink from the plate to the paper. Moreover this plate will do very good work on poor qualities of paper. Owing to the light pressure required, the plate is not worn even after many thousands of impressions, hence does not need to be renewed as often as is necessary with other kinds of plates.

52. Bain, 1,858,978, May 17, 1932. Ordinary flong molds, when employed for molding rubber plates, have the disadvantage that they are liable to collapse or to become deformed when subjected to the pressure and temperature necessary to vulcanize a rubber sheet into the mold; besides the flong tissue is liable to break away from the surface and to adhere to the vulcanized rubber. Because of these defects rubber printing plates have hitherto commercially been molded from plaster of Paris molds or lead plate molds. These, however, have the disadvantage that they cannot conveniently be kept for repeat work. Plaster molds, moreover, are liable to break, and both plaster and lead plate molds are relatively heavy and difficult to store.

The invention resides in producing rubber printing plates by molding from a flong mold without impairing the use of the mold for subsequent molding. To this end to prevent the mold from collapsing it is strengthened, while the beaten flong is still on the type and moist, by providing a stout backing. Type and mold thus backed are then placed as usual into a flong drying press. When dry, the mold surface is also treated to consolidate the flong tissue, to adapt it to resist pressure and heat, and to prevent it from tearing off or from adhering to the rubber. This condition is effected by treating the surface of the mold with a 2% solution of cellulose nitrate in acetone applied by brushing or in some other manner and allowed to dry. The mold thus ready for molding is then used as a matrix, and a sheet of semi-cured rubber is placed thereon, and the whole subjected to pressure under heat; use is made preferably of steam or steam heated platens whereby the rubber is simultaneously vulcanized while being forced on to the type impressions of the flong. Rubber plates so formed, thick enough to be resilient, may be readily used on flat or rotary printing presses with a minimum of make-ready and may be used with either spirit or letter-press.

53. Thomas, 1,902,048, Mar. 21, 1933. A composition for printing plates consists of commercial rubber cement 3 lbs., carbon tetrachloride 2 lbs., benzol 2 lbs., talcum 4 lbs., carbon black ½ oz.

54. Keltie, 1,941,148, Dec. 26, 1933. A printing plate has an impression surface of rubber united through an intermediate fabric layer to a backing layer of flexible hard rubber. This plate is adapted to be used in the Jean Berté process of patent No. 1,595,756.

Tire Patch Beveler. The operation of accurately beveling tire patch rubber without injury to the fabric backing of the strip consists in drawing the strip through a guide channel between a pair of abrasive wheels set to grind the desired bevel on the rubber. Any adhering rubber dust is removed from the buffed surfaces by a pair of rotating wire brushing wheels mounted as a portion of the mechanism.

Pneumatic Dust Collector for Mixing Rooms

FLOATING dust in the air of rubber compounding, mixing, and other processing rooms of rubber factories is a source of health hazard to workers and of untidiness causing economic loss. The attempt is frequently made to secure some relief from the dust nuisance in mill rooms by locating ventilating hoods over the mills, and connecting them with air ducts for discharge of the dust to the outer air.

The need of an efficient dust collection system has become particularly desirable, not to say urgent, in rubber plants mixing large tonnages of carbon black and other light gravity powders. This need has been met by ventilation engineers with a system of general industrial utility that lends itself to effective use for collecting dust of any sort.

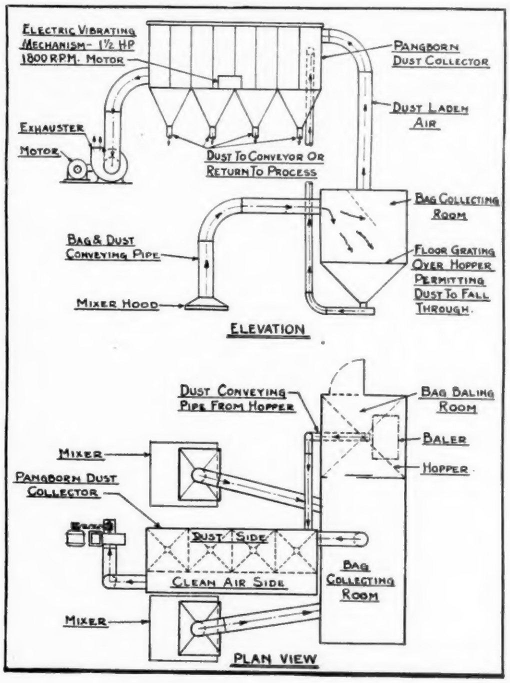


Diagram of Pangborn Bag and Dust Collecting System

This system, as adapted for use in a rubber mixing room, is represented in plan and elevation by the illustration. This diagrammatic sketch indicates the apparatus of the system with the function of each piece indicated. Thus in operating sequence the mixer hood is located over the mixer, whether mill or Banbury. It is connected by the bag and dust conveying pipe to the bag collecting room. The size of this pneumatic lift pipe depends upon that of the empty bags being conveyed.

A sufficient air velocity is maintained in the pipe to convey the bags over from the mixer hood to the bag collecting room; therefore the air volume of the system is governed by the size of the pipe, and the size of the dust collector is dependent upon the volume of air being handled in the system.

The dust from the bag collecting room is drawn through a pipe connection into the dust collector for salvaging. Next, beyond the dust collector is the exhaust fan and motor for operating the air movement of the system.

The system functions in the following simple manner. After the operator at the mixer has emptied the bag of compounding material he lifts it into the pneumatic conveying pipe, which also ventilates the mixing machine, and the bag is carried into the bag collecting room where, owing to the expansion of air and its consequent drop in velocity, the bag is dropped from the air stream. The size of this room need only be sufficient to allow a man to enter and remove the bags, but a room large enough to house the bag baler, as shown in the plan view, is preferable, thus keeping the bags and dust entirely within the system. Some installations employ a centrifugal-type cyclone collector to collect the bags, having an opening of sufficient size in the cone to permit the bag to fall into a baling room below. Such dust as settles out of the air stream in the bag collecting room is swept to one end through a grating into a hopper where it is pneumatically lifted to the cloth screen collector.

The collected bags are baled either in one end of the bag collecting room or else in an adjoining room, all of which must be air tight so that the exhauster will draw air from the hood over the mixer and not through openings in the room. The dust-laden air, however, is carried out of the bag collecting room to the cloth screen dust collector where the dust is filtered from the air and the cleaned air is exhausted to the atmosphere through the fan. It is to be noted that the fan handles only clean air.

The dust collected within the cloth screen collector is periodically vibrated off the screens by an electric motor-driven mechanism, falling to the collector hoppers, from which it may be bagged, conveyed away, or otherwise disposed of as best meets local conditions. The size of the cloth screen dust collector is directly proportional to the amount of air being handled. Therefore this size varies with the number of mixers or mills connected and the total air volume handled.

Ratios normally used in this work vary from one to 4 cubic feet of air per minute per active square foot of cloth. The normal limitations for cloth screen collectors are temperature and chemical reaction. The maximum advisable temperature using cotton cloth is 175° to 180° F. Materials which attack cotton cloth or steel sheets are not ordinarily handled although casings may be constructed of alloy metals and screen covering may be wool or asbestos cloth.

RUBBER THREAD. Rubber thread of reduced cross-sectional dimension is made from thread of greater cross-section by stretching the unvulcanized or partly vulcanized thread and then partially or wholly relieving the stresses produced while still in the extended condition, preferably by the action of heat. The thread may be produced initially in any known manner.

EDITORIALS

Collective Bargaining

THERE has been considerable doubt during the past few months whether industrial employes generally have taken advantage of the legislative privilege granted by Section 7 (a) of the National Recovery Act to bargain collectively with their employers through representatives of their own choosing.

To obtain first-hand information the National Industrial Conference Board made a nation-wide survey, the results of which were set forth in a comprehensive monograph[1], from which the following interesting statements are taken.

The form of inquiry was made as simple as possible, to induce the largest possible response. Companies were asked, in addition to the number of wage earners employed, whether they dealt with employes individually, through a plan of employe representation, or through an organized labor union. In case more than one method was used, the number or proportion of workers affected by each policy was asked. Companies that dealt with employes through a plan of employe representation or through an organized labor union were asked to indicate the date when the agreement became operative, and, in the case of a plan of employe representation, whether it was the joint-committee type, with representatives of both employes and management, or the employe-committee type, representing employes only.

Replies were received from 3,314 companies, which reported an aggregate employment of 2,585,740 wage earners, approximately 27% of the estimated total number of workers now employed in manufacturing and mining.

The companies and wage earners covered in the survey were classified under broad industrial groupings to give some idea of their distribution among different types of industries. Clothing and printing and publishing showed fewer than a majority of concerns dealing individually with employes, and the proportion runs as high as 87.1% in the chemical group. Petroleum had more than a majority in dealing individually with employes. The largest proportions of employes reported as under employe representation were in metal working, rubber products, metal mining, and petroleum refining.

The reports from 38 manufacturers of rubber products showed that 22 companies, representing 57.9%, were under individual bargaining; 11 companies, representing 28.9%, were under employe representation; 2 companies, or 5.3%, were union represented; and 3 companies, or 7.9%, were under various combinations of types.

The total wage earners given in these reports were 82,069 of which 14,610, representing 17.8%, were under individual bargaining; 65,288, representing 79.6%, were under employe representation; 2,171, or 2.6%, were union represented.

The most striking result of this survey is the relatively small proportion of employes found to be dealing with the employer through an organized labor union.

Whether industrial management has become reconciled to governmental supervision over its labor policy, as some contend, or whether it has accepted labor policy discipline only as an unavoidable feature of a broad campaign to extricate the country from the toils of a disastrous depression, it is evident that a large majority of employers are fulfilling their obligations in good faith. How many are doing so under the impression that the life of the Recovery Act is limited to 2 years and that thereafter governmental restrictions will be removed, and how many have accepted the new status as a presumably permanent change, it is impossible to say. Probably the future of collective bargaining rests on the manner in which it is used and on the broadmindedness and restraint of both employers and employes during the critical period when its most widespread use will coincide with the struggle of the entire country to emerge from the depression.

[1] By Harold F. Browne, of the National Industrial Conference Board's Research Staff.

Code Authority or Association?

THE National Recovery Administration plans to make a sharp division between code authorities and trade associations in order to prevent any abuse of industrial self-government by the latter organizations. When the supervision of business is gradually turned over to the various code authorities, the NRA is concerned about price fixing practices which trade associations are effecting. It is the desire that the code authorities should be the ruling power in each industry rather than the association. Authorities have a fairer representation of medium and small sized plants than have the executive boards of trade associations, who are usually dominated by the large concerns and are unsympathetic to the smaller manufacturers.

These matters will doubtless be brought up at the general meeting of code authorities to be held in Washington, D. C., on March 4.

What the Rubber Chemists Are Doing

Systematic Identification of Accelerators

Keiichi Shimada[1]

ORGANIC accelerators in general may be identified by the following systematic method.

About 0.05 g. of the purified sample to be tested is dissolved in 10 cc. of benzene (or a mixture of benzene and alcohol) in a test tube, and to this a few drops of a 1% solution of cobalt oleate in benzene are added, the color reaction being carefully examined. Generally speaking a purple, a yellowish green, a greenish blue, or a greyish violet coloration indicates the presence respectively of guanidines (except orthotolylbiguanide), a dithioacid, mercaptobenzthiazole, or hexamethylenetetramine. The melting point identifies the individual member in each group.

If the sample gives no color reaction, a second sample is dissolved as before, oxidized with a small amount of iodine (care must be exercised not to add too much iodine), and a few drops of the cobalt oleate reagent added. A characteristic greenish blue indicates that the original sample was one of the thiourea accelerators.

Failing a positive result in this second test, a third sample is dissolved in benzene, reduced by the addition of zinc dust and dilute hydrochloric acid, and a few drops of cobalt oleate solution introduced as before. A greenish blue or a yellowish green color now indicates the sample to be dibenzthiazyl disulphide or tetramethylthiuram disulphide respectively.

The special accelerators — acetaldehyde ammonia, methylene aniline, and methylene paratoluidine—which do not give color reactions with cobalt oleate, can easily be identified by well-established methods.

It should be noted, finally, that the above method of identifying organic accelerators cannot be applied to the highly colored aldehyde-amine accelerators of a resinous type, but these accelerators will be recognized at once by their characteristic odor and appearance so that the author did not deal with them in the present system.

[1] From the Kiryu Institute of Technology, *J. Soc. Chem. Ind. (Japan)*, Mar., 1933.

Testing Soft Rubber

I. Measurement of Vulcanization[1]

THE authors investigated numerous means for the measurement of vulcanization in rubber-sulphur and accelerated compounds. The discussion of the results follows.

While it would be convenient to have a single qualitative test which could be applied to all types of compound as a measure of the degree of vulcanization, no such test has been found which would be acceptable, even within the limits of compounding and processing used for this study. The milling test is the closest approach, and it is not sufficiently sensitive for quantitative use. A group of tests is therefore necessary. The use of the complete set of tests[1] gives a good composite picture of the degree of vulcanization. In some cases the changes measured follow so closely the same trend that only one measurement need be used. The tests with greater sensitivity and higher precision are more dependable than the others. A comparison of the results obtained with many stocks indicates that a satisfactory set of criteria for high-gum stocks mixed according to American Chemical Society procedure can be based on measurements of plasticity (Goodrich plastometer), hysteresis, and stress-strain. The following table gives a summary of the selected criteria together with approximate limiting values for unvulcanized and vulcanized rubber.

SELECTED CRITERIA OF VULCANIZATION AND APPROXIMATE LIMITING VALUES*

Criterion	Test	—Approx. Limiting Values— Unvulcanized Rubber	Well-Vulcanized Rubber
R_{100}	Plasticity	60	10
P_{100}/P_{30}	Plasticity	250	1
Set	Hysteresis	150	10
Set/modulus	Hysteresis	10	0.1
Modulus at 300%, kg./cm.^{2}	Hysteresis	1.41	24.6
Modulus at 500%, kg./cm.^{2}	Stress-strain	1.41	70.31
Ultimate tensile, kg./cm.^{2}	Stress-strain	1.41	351.5

* R_{100} signifies retentivity at 100° C.; P_{100} and P_{30} signify plasticity at 100° C. and 30° C., respectively.

All of the properties measured change with time of cure. They do not, however, all vary at the same rate. The relation between the plasticity changes and the tensile changes is particularly interesting. The former are largely complete before the latter become significant. The hysteresis set measurements, depending as they do both on plasticity and tensile characteristics, give values whose variation is intermediate between that of the other 2. The great drop in thermoplasticity in the earliest stages of cure is remarkable.

The range between these limits is available for measuring the degree of vulcanization. Practically all of the change in the plasticity factors, R_{100} and P^2_{100}/P_{30}, takes place in the earliest stages of the cure. On the other hand most of the change in tensile strength and modulus takes place in the later stages of cure. While about half of the decrease in hysteresis set and set/modulus takes place early in the cure, the change through the intermediate cures is sufficient to give a useful measure in this range.

These results suggest the probability that during vulcanization a mechanical structure is built up. Comparatively small structural effects are necessary to exert a large effect on plasticity. The development of tensile, however, re-

[1] "The Chemistry of Soft Rubber Vulcanization." By B. S. Garvey and W. D. White, B. F. Goodrich Rubber Co., Akron, O. Presented before the Division of Rubber Chemistry, at the 85th Meeting of the A. C. S., Washington, D. C., Mar. 26 to 31, 1933. Abstracted from *Ind. Eng. Chem.*, Sept., 1933, pp. 1040-46.

quires increasing strengthening of the structure. A rough illustration would be the building of a wooden scaffold. Comparatively few nails are required to hold the structure in shape. For strength, however, it is necessary to drive many nails in many places.

Ethanite

ETHANITE is a vulcanizable synthetic product recommended for use in the manufacture of packings, tubing, printers' rollers, valves, sheets, frictioned surfaces, pipe and tank linings, electrical equipment, etc., where it is necessary for the products effectually to resist the action of oils, solvents, greases, acids, ozone, and sunlight.

The material is a reaction product of ethylene dichloride and soluble polysulphide. It is supplied in the form of thin sheets, pale yellow in color. Its specific gravity is about 1.60.

It can be compounded and vulcanized with or without sulphur. The odor from Ethanite is harmless, but for a time may be unpleasant. Any irritation is temporary. It is recommended that this product be compounded on a hooded mill.

Catalpo in Tires and Tubes

CATALPO is a chemically refined clay manufactured to obtain a very fine and uniform particle size. It is purged of all grit by the latest method of colloidal chemistry, hence imparts to rubber remarkable physical properties.

This chemically refined clay is not to be confused with crude pulverized clays which contain a large quantity of grit pulverized to pass through a screen of 200- to 300-mesh. Further, pulverized clay contains a wide variation of clay particles which tend to increase the modulus of a rubber stock. Being chemically treated the pH value of Catalpo is controlled within narrow limits. This gives very good aging and heat resisting properties. Therefore it is being used to compound truck tire carcasses, inner tubes, insulated wire, hose covers, etc.

Sample Catalpo mixings follow.

STOCK FOR MAXIMUM ABRASION RESISTANCE

Smoked sheet	100
Zinc oxide	5
Sulphur	3
Stearic acid	4
Captax	1
Catalpo	52

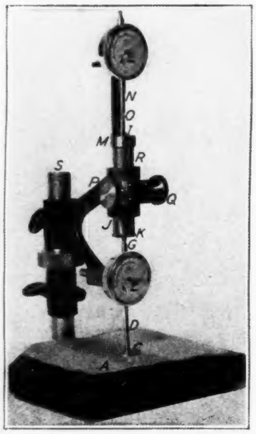
Cure 40 lbs. in laboratory press.

Minutes	Tensile Lbs.	Elongation—%
30	3,860	675
45	3,960	675
60	3,850	650
75	3,760	650

INNER TUBE STOCK

Smoked sheet	100
Butene	1
Sulphur	2
Zinc oxide	10
Stearic acid	1.5
Palm oil	1
Catalpo	28
BLE	1

Cured 6 minutes at 307° C. in a tube mold. Tensile 3,780 lbs. Elongation 600%.



The Compressometer

Compressometer[1]

THE instrument pictured is designed to measure the thickness and the change in thickness of textiles, sheet rubber, or paper. The specimen *A* is placed upon the anvil *B*. The foot *C* is circular, one inch in diameter and is fastened to the bottom of the spindle *D*. The lower surface of the foot is plane and parallel to the upper surface of the anvil. A rod is fastened to the top of the spindle at *G* and to the top of a helical spring at *I*. The bottom of the spring is fastened to the tube *J* at *K*. The upper dial micrometer *L* is fastened to the top of the tube at *M*. The spindle *N* of the upper dial micrometer rests on the top of the rod at *O*. The tube may be moved up or down relative to the frame *P* by turning the knob *Q* of the rack and pinion *R*.

By turning the knob the foot may be lowered upon the specimen and the pressure applied may be ascertained from the upper dial reading and a calibration curve of the spring. The upper dial indicates the elongation of the spring. The thickness of the specimen is indicated on the lower dial. Each dial is graduated to read directly to 0.001-inch.

[1] *Bur. Standards, J. of Research*, June, 1933, pp. 705-13.

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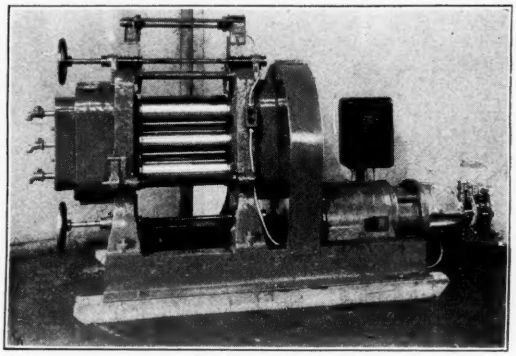
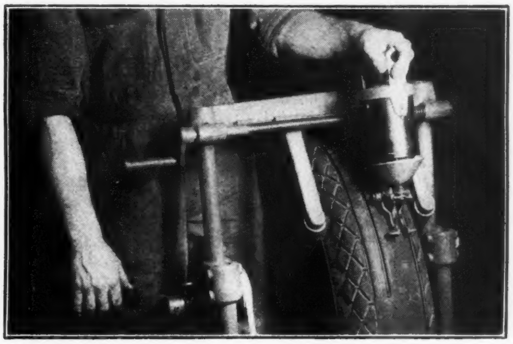
New Machines and Appliances



Thropp Improved Laboratory Calender



Summit Regrooving Machine

Laboratory Calender

THE laboratory is accepted as a most important adjunct of the well-equipped rubber and plastic factory. The motor driven 3-roll calender pictured is specially designed for sheeting laboratory stocks for experimental purposes. These calenders are built for even motion work or frictioning singly or as a combination machine adaptable for either of these operations.

Tests can be made on these calenders to the same effect as on factory-size machines as the speeds are in proportion. Every feature of their design and construction is in accordance with modern machine practice and specifications. In fact the laboratory calender is built as a counterpart of the mill calender.

Operating safety is effected by mounting on the end of the motor shaft a spring-set electrically operated brake, and at the top of the calender is a set of levers with a switch for actuating the brake. William R. Thropp & Sons Co., Trenton, N. J.

Viscosity Regulator

IN MANY processing industries, the production departments are called upon to produce or use viscous liquids, suspensions, or solutions, the viscosity of which is a critically important factor. The equipment here illustrated is especially adaptable to continuous processes and may be arranged automatically to regulate viscosity or density by adding lighter constituents; regulating viscosity controlled cooling or heating mediums; and controlling evaporation by viscosity.

The particular unit in the illustration is a viscosity regulator designed to regulate automatically and continuously the viscosity of electrical wire insulating varnish at a large electrical manufacturing plant. The varnish is constantly circulating and tends to become heavier because of evaporation of highly volatile solvents. The extremely delicate nature of the varnish coating and the perfection of covering effect demanded make automatic regulation of the varnish an imperative necessity.

This machine may be used in the rubber manufacturing industry where volatile liquid coatings are applied to bright finished shoes, insulated wire, and lustrous surfaced miscellaneous products and novelties; also for the adjustment of the density of latex dispersions and solvent cements for dipping, or as paint spraying finishes.

The viscosity regulator receives its regulating impulse from a slowly revolving agitator suspended in the liquid to be regulated. Any change in viscosity, as reflected by varying the agitator rotative resistance, is transmitted by sensitive mechanical means to a needle valve which admits just enough thinning vehicle to maintain constant viscosity within close limits. Merritt Engineering & Sales Co., Inc., Lockport, N. Y.

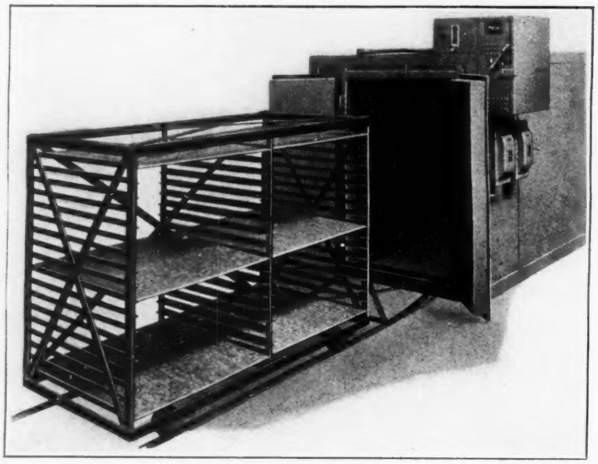
Meyers-Mesco Viscosity Regulator

Tire Tread Groover

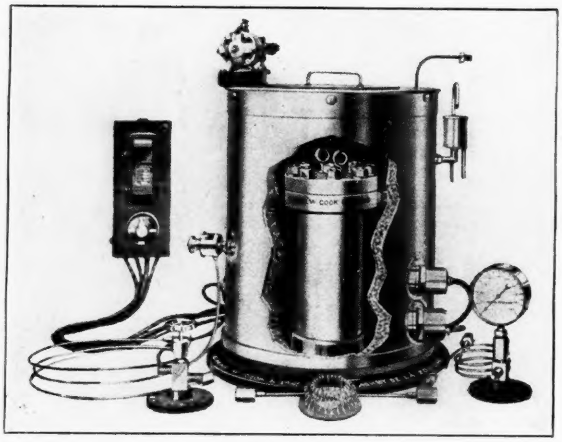
RESTORATION of the anti-skid grooving on the tread of an automobile tire is rapidly and neatly effected by the electrically operated tool pictured. This unit is equipped with a universal type of motor suitable for any 110-volt current. The motor is cooled by a high efficiency fan located in the conical shield between motor and cutter. A pair of guides or shoes bears upon the tire tread and follows all of its depressions. The depth gage of the tool is connected by a tension spring with the bearing shoes. Three sizes of cutters of gouge form, $\frac{1}{4}$-, $\frac{3}{16}$-, and $\frac{3}{8}$-inch, are supplied with the machine. These knives are oscillated by the motor and do not make a complete revolution, but work on a 65° arc. With this machine it is possible in 10 minutes to cut 4 circumferential grooves and reproduce the diamonds in the center of the tread of a tire like that shown in the illustration. Summit Industrial Instrument Co., 60 Cherry St., Akron, O.

Thermo-Electric Ovens

OVENS and driers are essential equipment for many industrial and laboratory processes. Formerly such heaters were crude in construction and inefficient in operation because they were faulty in design and lacked means for close working control. These conditions were tolerated for many years in those branches of the rubber industry where dry heat vulcanization was practiced before the scientific thermo-



Freas Industrial Oven



Cook Rubber Aging Apparatus

electric industrial oven became available. They became familiar first as laboratory equipment and are now adopted industrially for heat treating materials and goods in various lines of manufacture including experimental and production scale vulcanization and the accelerated aging of rubber goods.

The illustration represents a floor model of a well-known type of an electrically heated and automatically controlled industrial oven. This form is provided with a truck carrier accommodating a batch of trays, and tracks to facilitate the movement of the truck. Freas Thermo-Electric Co., Irvington, N. J.

Bomb Aging Apparatus

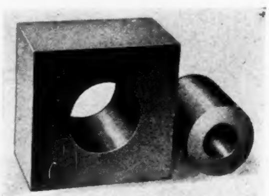
THE apparatus pictured is constructed to utilize heat as well as oxidation or a combination of both for conducting the well-known bomb aging test of vulcanized rubber originated by Bierer and Davis. The latest methods of heating and control, and stainless steel are combined in the design by expert knowledge and experience in the manufacture and use of high pressure apparatus.

Briefly, it comprises a double walled copper tank thermally insulated with granulated cork and mounted on a compressed cork and cast-iron base. The tank is provided with a motor stirrer, draw-off cock, provision for thermometer, copper drip water fitting, removable copper perforated baffle plates, thermostat, one 4.5- and 2, 700-watt immersion heaters with necessary rubber insulated flexible cable to 3-heat switch and switchboard. The receptacle, a stainless steel cylindrical vessel, fits into a recess central in the tank base plate. The vessel has studs and nuts for bolting on the cover. A screwed fitting is attached to the vessel flange with coupling and copper tubing to the gage block, thence through a wired glass window to the valve block and the usual standard oxygen cylinder. The overall dimensions of the apparatus are approximately 20 inches diameter by 30 inches high.

Information, instructions, advice as to site, suitability of rooms, and methods of using are furnished by the manufacturer. Chas. W. Cook & Sons, Ashby de la Zouch, Leicestershire, England.

Oilless Rubber Bearings

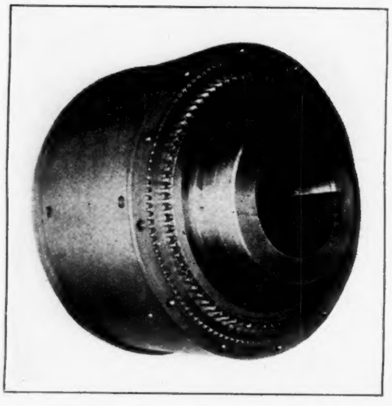
A DRY, unlubricated bearing composition has been perfected that is practical on all slow-speed, low-pressure machines. A bearing of this material can be run for an indefinite time in any solution not harmful to rubber without special lubrication or attention. It machines and finishes as easily as soft brass and can be obtained as a complete bearing or in solid square or round bars of 1-inch section or up in increments of ¼-inch.



Parock Oilless Bearings

Its weight is one ounce per cubic inch; percentage of graphite, 80%; maximum atmospheric and bearing temperature, 250° F.; percentage of oil absorption, none; in fact oil is harmful to it. The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.

Torque Ring Coupling



Waldron Torque Ring Coupling

THE illustration represents an all-steel lubricated gear-type coupling of unique and patented construction. In its design heavy connections have been eliminated because they are difficult to keep tight, and any leakage of lubricant naturally results in wear. The torque is carried by lubricated surfaces through solid metal parts from hub to hub. The end plates simply form the dust and moisture-proof enclosure with the center sleeve to contain a supply of oil said to be adequate for long periods of operation between additions or renewals of the lubricant.

The hubs are alike with toothed flanges at their centers; thus making it possible to turn them end for end and obtain new driving surfaces in case the original tooth faces become worn.

The torque rings, from which the coupling derives its name, are 2 solid steel rings with teeth cut on inside and outside. Thus is provided what is called quadruple engagement or 4 points at which relative movements between the cooperating teeth can freely take place and thereby provide for misalinements or endwise displacement of the connected shafts. The torque rings are loosely held in place within the cover sleeve and they, together with the cover sleeve, are handled as a single unit. By removing either end plate the cover sleeve and torque rings can be moved in the opposite direction as most desirable to line up initially or subsequently to check alinement from the faces of the inner hubs.

These couplings are especially suitable for heavy duty direct-connected and geared motor and engine drives. Smith & Serrell, Newark, N. J.

New Goods and Specialties

Lee Inner Tube

Matinee Tie

Bevel Weld Inner Tubes

THE familiar constriction so markedly apparent in inner tubes under inflation is due to the overlap of the spliced ends and is the cause of serious unbalance of the tire, resulting in wheel shimmy, tramping at high speeds, and irregular tire wear. These evils are practically eliminated in the bevel weld inner tubes in which objectionable overlap is entirely obviated. Such a tube expands so uniformly throughout its circumference that it is almost impossible to detect the point at which the splice was made. Thus its splice strength is practically identical with the strength of the body of the tube; whereas with ordinary molded tubes the splice strength varies between 40 and 70% of the tube strength.

The importance of this uniform tube wall in improving the riding qualities of the tire casing cannot be overestimated. Lee Tire & Rubber Co., Conshohocken, Pa.

Tubing Display Card

SINCE a 5-foot length of rubber tubing is considered essential in almost every home, The B. F. Goodrich Co., Akron, O., offers to the druggist an attractive display card that brings this fact to the attention of the customer and helps sell the product. This card, lithographed in 3 colors, is so constructed that it securely holds a length of tubing. The latter, in 5-foot lengths, $\frac{5}{16}$ by $\frac{1}{16}$, has rolled ends.

Galoshes That Tie

NOTHING new under the sun? Well, how about these rubber galoshes that lace up the front, thus doing away with fasteners and snaps that can damage stockings and irritate sensitive fingers? And—these Raynshus are even fur-trimmed for those who crave the most luxurious of footwear! Laces and fur are waterproofed by a special process which adds to life and appearance.

Raynshu Ties, as they are known, are made in satin, faille, and reptilian textures in black or brown. The matching fur trim is presented in 2 fashions: a plain cuff or one extending down over the instep. This last model, for more festive moods, is available also in white. Is it smart! Cambridge Rubber Co., Cambridge, Mass.

Fig. 1. Mounted Valve Assembly

Fig. 2. Application of Ezemount Cap

New Valve Assembly

THE Ezemount valve assembly, here illustrated, was created to match the trend of new streamlined cars and will be found in wide use on 1934 cars with the new wheels of the drop center type, chromium finish, etc. This valve assembly provides a modern appearing chrome-finished valve combination having adequate length, but allowing for minimum protrusion after the mounting is completed.

Figure 1 shows the brightly finished, short protruding valve assembly after the mounting has been completed. It allows for tightening the hexagon nut from the outside of the rim. The rim nut is omitted to permit the assembly to pull back through the rim hole should the tire go flat.

The Ezemount cap applied as shown in Figure 2 lengthens the assembly for easy mounting; the valve holding tool is applied to keep the valve stem in position until the tire is inflated.

An Ezemount cap may also be used with a rim nut where preferred. A. Schrader's Son, Inc., 470 Vanderbilt Ave., Brooklyn, N. Y.

Rubber Industry in America

OHIO

Goodyear-Sears-Roebuck Hearing

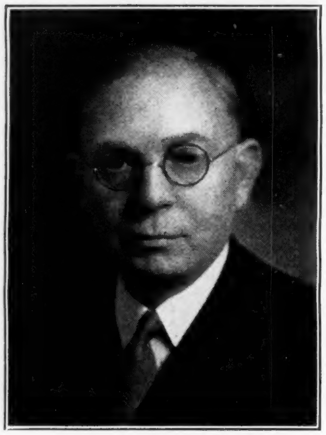
The Federal Trade Commission hearing on the Goodyear-Sears-Roebuck tire and tube contract opened in Chicago, Ill., on January 29 after a 2-week session in Akron. The taking of testimony from Sears-Roebuck officials and other tire executives continued until February 9 when the Chicago hearings were adjourned, to be convened in Akron at 5 days' notice, but not before February 19.

The Barr Rubber Products Co., manufacturer of mechanical molded goods, toys, druggists' sundries, etc., Sandusky, recently elected Arthur D. Benedict vice president in charge of sales. Randolph Dorn is Barr president.

The India Tire & Rubber Co., Mogadore, reorganization plan submitted by former President W. G. Klauss and approved by Common Pleas Judge Lionel S. Pardee on January 24, is being put into effect. A new firm, India Tire Co., with Mr. Klauss as president, was formed to take over the assets of the old company. This reorganization will save the jobs of 550 employes. Increased production has already begun at the Mogadore plant, which has a daily capacity of 2,500 casings.

The Firestone Tire & Rubber Co., Akron, which recently lost a suit to the United States Rubber Co., New York, N. Y., for infringement of tire patents, will appeal to a higher court. Firestone has taken bids for the construction of a warehouse and service station to cost $75,000 and to be erected at Tenth and Walnut Sts., Des Moines, Iowa. The new structure will be modern in every detail, 2 stories, 132 by 132 feet, of structural steel and fireproof. Norman A. Shepard, Firestone director of chemical research, lectured the student chapter of the American Institute of Chemical Engineers at the University of Illinois on January 18, on "The Chemical Engineer and the Rubber Industry."

The Hydraulic Press Mfg. Co., Mt. Gilead, at a recent annual meeting of the directorate elected Frank B. MacMillin, executive vice president, to the presidency and general managership of the company. His son, Howard F. MacMillin, formerly vice president in charge of sales, was named vice president and assistant general manager. Walter G. Tucker, son of the founder of the company, who had been president, was elected chairman of the board.



F. H. Meyer

F. H. Meyer has been named vice president and general manager of The Adamson Machine Co., Akron, well-known maker of rubber machinery. His experience of the past 11 years in sales promotion, factory management, and engineering work as assistant to the president and sales manager of The American Welding & Mfg. Co., Warren, equips him ideally for the duties of his new position. He comes to Akron highly recommended by his many business acquaintances and friends in the rubber industry.

The Patterson Foundry & Machine Co., East Liverpool, O., announced the expansion of its New York, N. Y., branch at 30 Church St., by the appointment of C. V. Murray, for over 13 years sales engineer for the Robinson Mfg. Co., Muncy, Pa.

Roscoe M. Gage, with The Fisk Rubber Co., Chicopee Falls, Mass., for several years in laboratory and process engineering work, has resigned to accept a similar position with the Mansfield Tire & Rubber Co., Mansfield, O.

Seiberling Rubber Co., Akron, has made V. E. Atkins, former general superintendent, general factory manager, succeeding William S. Wolfe, vice president in charge of production, who resigned January 1.

The Henderson Tire & Rubber Co., Bucyrus, which recently completed the sale of $50,000 in capital stock, expects to start tire production before April 1. Officers elected include C. O. Henderson, president and general manager; John Q. Shunk, president of the Shunk Mfg. Co., also of Bucyrus, vice president; and William C. Beer, secretary. The directorate comprises officers, W. J. Schwenck, and F. L. Hopley.

Business Continues to Improve

The upturn in business continues to show gradual improvement and production gains, with notable increase in distribution figures.

The Department of Labor at Washington estimated that since March 1, 1933, the nearest date for which figures are available, employment in manufacturing and non-manufacturing industries has increased by 2,387,000, with $60,200,000 added to the weekly payroll. This has been accomplished, the department reported, with only a slight increase in the cost of living index—135 as of December 1, 1933, compared with 132.1 December 1, 1932.

Figures from the important industrial centers indicate that unusual gains in employment are being registered all over the country. Akron reports an extraordinary tire demand for both original equipment and replacement, with the result that production schedules are greatly increased. Wages have also been stepped up, in some cases, to the level of 1929.

The Pioneer Rubber Co., Willard, stockholders at their recent annual meeting were informed that the company closed 1933 in a much better financial position than it did 1932. The cost of the new equipment for latex processes has been met, and better business conditions in 1934 should materially aid the company. The following unanimously reelected directors: R. K. Williams, Kenneth L. Milligan, John Clay, C. C. Hessler, and J. C. Gibson elected the latter president and treasurer and Mr. Milligan vice president and secretary.

Monsanto Petroleum Chemicals, Inc., a controlled affiliate of Monsanto Chemical Co., St. Louis, Mo., has been organized with headquarters in Dayton, O., and will take over the plants and process of The Dayton Synthetic Chemicals Co., producer of a resin made from petroleum gases, in which field of chemistry Monsanto has done considerable research. Patents and processes of both Monsanto and Dayton Synthetic are pooled in Monsanto Petroleum Chemicals, Inc., which will undertake their development and continue research in the field of petroleum chemistry. Edgar M. Queeny, Monsanto president, is president of the new firm; while Charles A. Thomas is vice president and general manager in charge of the administration of the company.

EASTERN AND SOUTHERN

A. S. T. M. Meetings

The A.S.T.M. Standing Committees will hold their 1934 spring group committee meetings in Washington, D. C., beginning March 5 and extending through March 9. In conjunction with these will be held the 1934 Regional Meeting of the American Society for Testing Materials, scheduled for March 7 in the Wardman Park Hotel, at which will be given a symposium on outdoor weathering of metals and metallic coatings.

The sessions of Committees D-11 on Rubber Products and D-13 on Textile Materials will have special interest for rubber chemists and technologists as indicated by the following official outline of their activities.

Committee D-11 has devoted its attention to the development of test methods for rubber products rather than sponsoring material specifications. They offer in this line tests for various types of power transmission belting; methods of test for rubber hose, both wrapped and braided constructions; requirements for both standard and heavy cotton braid on insulated wire and cable, etc. A new subcommittee has been formed to develop suitable tests for volume increases of rubber in oils and various solvents.

Committee D-13 has prepared a comprehensive analytical key for the qualitative identification and quantitative analysis of mixtures of all important fibers of mineral, animal, and vegetable origin. These methods supersede the former methods of identification of textiles. An extensive glossary of definitions and terms for textile materials is also completed. Work is in progress on specifications for single-yarn tire-chafer fabrics, and plans are being made for the development of a fatigue test for tire cord.

Kelly-Springfield Tire Co., 1775 Broadway, New York, N. Y., through President W. H. Lalley, has announced certain changes in the personnel of the company for economy and efficiency. No further changes are contemplated. W. S. Wolfe, formerly with the Seiberling and Goodyear companies, has been appointed general factory manager.

The Rubber Manufacturers Association, Inc., of which A. L. Viles is president, will occupy, about March 1, 2 floors at 444 Madison Ave., New York, N. Y. The R. M. A. has been appointed the executive agency for the NRA rubber industry codes; therefore larger quarters are necessary.

The National Association of Waste Material Dealers, Inc., and all its affiliated divisional associations will hold their twenty-first annual convention March 19, 20, and 21 at the Hotel Astor, New York, N. Y. The twenty-first annual banquet is scheduled for March 21.

Fabian Studios

W. J. R. Hauser

Heveatex Executive

W. John R. Hauser, vice president in charge of sales for the Heveatex Corp., Melrose, Mass., has had many years of experience with latex development both in this country and also abroad.

After having spent many years in Great Britain, the Argentine, and the United States, Mr. Hauser became interested in latex through his older brother, Dr. Ernst A. Hauser, one of the pioneer workers in the development of concentrated latex, formerly head of the Colloid Chemical Laboratory of Metallgesellschaft, Frankfurt a.M., Germany, but now chief chemist of the "Semperit" - Austro - American Rubber Works, Vienna, Austria.

After gaining some knowledge of rubber in general with a London, England, broker, Mr. Hauser went to Frankfurt a.M. in 1927, where he spent some time with the continental selling agent for Revertex. Then he returned to London to propagate concentrated latex and its uses in the British Empire.

To develop and further the sales of concentrated latex in the United States and Canada, Mr. Hauser came to New York, where he made his business address with L. W. Dumont & Co. While here, he introduced latex to the trade and was instrumental in forming the Revertex Corp. of America. He was elected vice president of this company, a position he held until his resignation on January 15, 1934.

On February 1 he joined the Heveatex Corp. as vice president in charge of sales. He opened the New York branch at 90 Broad St. (telephone, Bowling Green 9-4833) to supply latex, latex concentrates, and latex compounds of every description.

Rubber Code News

Public meetings preceding the forthcoming general Code Authority conference and intended to develop constructive criticisms and suggestions regarding policies and code administration for consideration in that conference were ordered February 14 by National Recovery Administrator Hugh S. Johnson.

Management, labor, and consumers, in short, the general public, is invited to participate either in person or by written statement in open meetings starting February 27 to the end that the Code Authority Conference beginning March 5 "shall have the benefit of public suggestions, criticisms, and petitions with respect to any phase of policy or administration of Codes of Fair Competition." No individual code will be under consideration, and no suggestions or petitions with respect to a specific code or provision thereof will be received.

To obtain all possible points of view on the major problems facing the Code Authority Conference simultaneous public meetings on those problems, begun 10 o'clock, February 27, are scheduled as follows:

Meeting No. 1. Employment: Possibilities of increasing employment; wages and hours; comparative situation of capital goods and consumer goods industries. Auditorium of Department of Commerce Building.

Meeting No. 2. Trade Practices: Costs and prices; protections against destructive competition and against excessive prices and monopolistic tendencies. Willard Hotel, large ball room.

Meeting No. 3. Trade Practices: Control of production; limitation of machine hours; restriction of expansion of facilities; ethical practices regulating competitive relationship. Washington Hotel, Hall of Nations.

Meeting No. 4. Code Authority Organization: Code administration, including compliance and enforcement; inequalities, inconsistencies, and overlapping in codes; interindustry and intercode coordination; financing code administration; use and control of the Code Eagle. Mayflower Hotel ball room.

Meeting No. 5. Small Enterprises and Minorities: Operations of codes in small enterprises; position of minorities. Raleigh Hotel, large ball room.

Code Authorities[1]

General Code Authority Members. A. L. Viles, chairman, president, Rubber Manufacturers Association, Inc.; O. C. Pahline, Goodyear Tire & Rubber Co.; T. J. Needham, United States Rubber Co.; F. D. Hendrickson, American Hard Rubber Co.; R. E. Drake, Avon Sole Co.; J. H.

[1] For Tire Code Authority see India Rubber World, Feb. 1, 1934, p. 45.

Connors, The B. F. Goodrich Co.; M. I. Woythaler, Hodgman Rubber Co.; Wm. Lichtenstein, Peerless Garment Co.; F. T. Lane, Seamless Rubber Co.; B. B. Felix, Featheredge Rubber Co.

ALTERNATES (Respectively). No alternate chairman; Paul Coste, U. S. Rubber; A. B. Newhall, Hood Rubber Products Co.; Bruce Bedford, Luzerne Rubber Co.; H. T. Mason, Quabaug Rubber Co.; H. N. Young, Hamilton Rubber Mfg. Co.; A. K. Dannenbaum, Aldan Rubber Co.; Moe Sherman, Sherman Bros. Rainwear Co.; T. W. Casey, Seiberling Latex Products Co.; G. B. Dryden, Dryden Rubber Co.

AUTO FABRICS, PROOFING AND BACKING DIVISIONAL AUTHORITY MEMBERS. M. I. Woythaler, Hodgman Rubber Co.; J. T. Callahan, Archer Rubber Co.; H. M. Freydberg, Acme Backing Corp.; N. E. Bowman, Pocono Co.; W. H. Jenks, L. C. Chase Co.

ALTERNATES (Respectively). A. K. Dannenbaum, Aldan Rubber Co.; C. Kenyon, Jr., Vulcan Proofing Co.; F. N. Kite, Windram Mfg. Co.; J. D. Lippman, Textile-Leather Corp.; N. Boynton, Jr., Boston Woven Hose.

FLOORING DIVISIONAL CODE AUTHORITY MEMBERS. O. C. Pahline, chairman, Goodyear; W. G. Titus, Hamilton Rubber; M. A. Turner, Stedman Rubber Flooring Co.

ALTERNATES (Respectively). Paul Coste, alternate chairman, U. S. Rubber; W. I. Lewis, Boston Woven Hose; H. T. Mason, Quabaug Rubber.

FOOTWEAR DIVISIONAL CODE AUTHORITY MEMBERS. T. J. Needham, chairman, U. S. Rubber; A. H. Wechsler, Converse Rubber Co.; C. E. Speaks, Firestone Footwear Co.

ALTERNATES (Respectively). A. B. Newhall, alternate chairman, Hood Rubber Products Co.; C. E. Little, Servus Rubber Co.; J. F. Muffley, Endicott-Johnson Co.

HARD RUBBER DIVISIONAL CODE AUTHORITY MEMBERS. F. D. Hendrickson, chairman, American Hard Rubber Co.; J. A. Smith, Hood Rubber Products Co.; D. N. Hill, vice chairman, Goodrich; H. T. Fowler, Continental; J. L. Hunter, Ahlbell Battery Container Corp.

ALTERNATES (Respectively). Bruce Bedford, Luzerne Rubber Co.; O. S. Dollison, Republic Rubber Co.; S. H. Renton, Vulcanized Rubber Co.; S. T. Campbell, Aetna Rubber Co.; W. H. Martindell, Joseph Stokes Rubber Co.

HEEL AND SOLE DIVISIONAL CODE AUTHORITY MEMBERS. R. E. Drake, Avon Sole Co.; M. Eisen, Holtite Mfg. Co.; R. H. Cory, O'Sullivan Rubber Co.; T. Dabney, Goodyear; Miah Marcus, Panther-Panco Rubber Co.

ALTERNATES (Respectively). H. T. Mason, alternate chairman, Quabaug Rubber Co.; Sol Schwaber, Monarch Rubber Co.; H. S. Maddock, Essex Rubber Co.; H. A. Derry, United States Rubber Co.; M. D. Maskrey, Goodrich.

MECHANICAL GOODS DIVISIONAL CODE AUTHORITY MEMBERS. J. H. Connors, chairman, B. F. Goodrich Co.; C. D. Garretson, Electric Hose & Rubber Co.; H. N. Young, alternate chairman, Hamilton Rubber Mfg. Co.

ALTERNATES (Respectively). W. C. Winings, Goodyear Tire & Rubber Co.; P. H. Henkel, Continental Rubber Works; A. C. Kingston, Boston Woven Hose & Rubber Co.

SPONGE RUBBER DIVISIONAL AUTHORITY MEMBERS. B. B. Felix, chairman, Featheredge Rubber Co.; F. M. Daly, Sponge Rubber Products Co.; L. H. Chenoweth, Goodrich.

ALTERNATES (Respectively). Geo. B. Dryden, alternate chairman, Dryden Rubber Co.; R. J. Limbert, Lee Tire & Rubber Co.; Geo. E. Jeandheur, Elmhurst Rubber Co.

RUBBER SUNDRIES DIVISIONAL CODE AUTHORITY MEMBERS. F. T. Lane, chairman, Seamless Rubber Co.; H. A. Bauman, (Bathing Apparel), Goodrich; F. J. Wilson, (Rubber Gloves), Wilson Rubber Co.; H. B. Elmer, (Stationers), Eberhard Faber Rubber Co.; T. W. Casey, (Druggist, etc.), Seiberling Latex Products Co.

ALTERNATES (Respectively). Mr. Casey; W. R. Douglas, U. S. Rubber; H. P. Croxton, Massillon Rubber Co.; Robert Sauter, A. W. Faber, Inc.; E. I. Kilcup, Davol Rubber Co.

RAINWEAR DIVISIONAL CODE AUTHORITY MEMBERS. Wm. Lichtenstein, Peerless Garment; Fred Monosson, Cosmopolitan Mfg. Co.; Moe Sherman, Sherman Bros.; Simon Harris, Harris Raincoat Co.; A. D. Usow, Badger Raincoat Co.; A. B. Zuckert, A. B. Zuckert Co.; James J. Drummey, U. S. Rubber.

ALTERNATES (Respectively). Robert P. Cable, Cable Raincoat Co.; Sam Goldstein, Old Colony Mfg. Co.; Chas. Plottel, Plottel Bros.; David Asch, Quality Coat Co.; F. F. Sommers, Jr., Chicago Rubber Clothing Co.; Max Kovitz, Atlas Raincoat Mfg. Co.; Geo. E. Goodwin, Archer Rubber.

United States Rubber Co., 1790 Broadway, New York, N. Y., through L. M. Simpson, general sales manager, tire department, announced the following organization changes. H. C. McDermott, assistant district manager at New York, N. Y., was appointed district manager at Cincinnati, O., succeeding C. A. Cornell, who becomes district manager at St. Louis, Mo., succeeding M. J. Herold, resigned. R. W. Collings, formerly at the general office in New York, now is Mr. McDermott's assistant. Mr. Cornell's assistant is C. W. Duffy, recently field representative at Cincinnati. Page Noll, former district manager at Kansas City, Mo., now manager of distributers' sales, southwestern division, will handle the R. V. Smith account in Oklahoma City, Okla., Straus-Frank Co., San Antonio, Tex., and the Acme Co., Shreveport, La. This new responsibility is in recognition of greatly improved business in Kansas City under Mr. Noll. Although he will operate directly from the general office, his headquarters for the present will remain at Kansas City. G. R. Cowden, district manager at Atlanta, Ga., succeeds Mr. Noll at Kansas City. Mr. Cowden's successor is S. L. Martin, former manager of the Quick Tire Retail Store, Atlanta. E. J. Cross, district manager at Syracuse, N. Y., was given a special assignment in the Boston, Mass., district. He is succeeded by M. N. Brady, assistant district manager at Chicago, Ill. E. E. Trundle was named to Mr. Brady's former post.

New U. S. Rubber Tire

The new lower pressure tire built by U. S. Rubber, as shown in the illustration, is said to reduce wind resistance, eliminate noise, and provide greater riding comfort.

Lockwood Greene Engineers, Inc., has moved its New York, N. Y., executive office from 100 E. 42nd St. to 30 Rockefeller Plaza and its Boston, Mass., office from 24 Federal St. to 40 Central St. The firm has another office at Montgomery Bldg., Spartanburg, S. C.

The Textile-Finishing Machinery Co., Providence, R. I., has established a branch office at 919 Johnston Bldg., Charlotte, N. C., for the greater convenience of southern customers. H. G. Mayer and James Cook will represent the company, with headquarters at the Charlotte office.

Dr. I. Drogin, of J. M. Huber, Inc., 460 W. 34th St., New York, N. Y., was the guest speaker on January 30 at the Technical School, Palmerton, Pa., before a class in rubber technology. He lectured on carbon black, its development, manufacture, and application to various industries. A series of specially prepared slides illustrated the talk. George S. Haslam, chief of the rubber section of The New Jersey Zinc Co., 160 Front St., New York, was chairman of the meeting. Among those present were the following New Jersey Zinc officials: E. J. Flynn, plant superintendent; E. H. Bunce, general manager of the technical department; and L. A. Wilson, chief of the testing department.

(Continued on page 52)

OBITUARY

"Father of Trusts"

THE noted industrialist, Charles Ranlett Flint, died from a stroke, after having been an invalid for 2 years, in Washington, D. C., on February 13, 1934. He was born January 24, 1850, at Thomaston, Me., and attended local grade schools. When 18, he was graduated from the Brooklyn Polytechnic Institute.

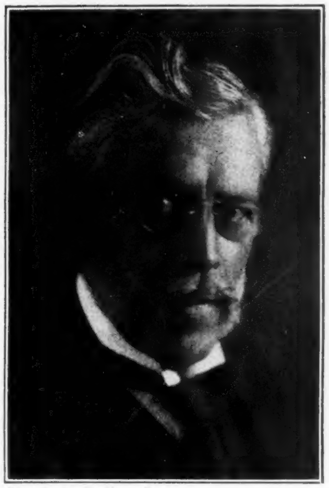
His business career began with the New York, N. Y., shipping concern of W. R. Grace, which engaged actively in the Para rubber trade. In 1871 Mr. Flint became a partner in Gilchrist, Flint & Co., which did a general commission business with South America. The next year his firm merged with W. R. Grace & Co. Thus developed Mr. Flint's many important financial relations with South American countries. In 1885 he retired from the Grace firm and established Flint & Co., rubber, lumber, and general commission merchants. Later he branched out and expanded with other organizations into a world-wide importing and exporting business.

As an industrialist he came prominently into view in connection with rubber interests and particularly their consolidation. He was preeminently an organizer of capital in industrial affairs and one of the first prominent advocates in America of industrial combination, achieving his first success in that line by bringing the rubber shoe industry under a single control as the United States Rubber Co., with $50,000,000 capital. This for a time was one of the largest industrial organizations in existence. Its plan of organization served as a model for innumerable later enterprises.

Besides serving as treasurer of the United States Rubber Co. for nearly 10 years, Mr. Flint was active, in 1892, in bringing about the combination of interests known as the Mechanical Rubber Co., in which he was a director, and which was merged, in 1899, with a larger consolidation, the Rubber Goods Mfg. Co., of which he became chairman of the board of directors. He was likewise in the directorate of 3 or 4 of the constituent companies of the United States Rubber Co. and of the American Chicle Co.

For several years also Mr. Flint was treasurer of the New York Commercial Co., Ltd., crude rubber importer. Later, disposing of his interest in that company, he organized the Crude Rubber Co.

At different periods he served as consul in New York for Chile, Nicaragua, and Costa Rica. He had foreign interests on every continent and adventured in supporting tottering thrones and tropical republics. He also acted in 1908 as negotiator for the Wright brothers in offering the first practical airplane to foreign governments and was a confidential agent to the United States government. When 73, Mr. Flint wrote his biography, "Memoirs of an Active Life—Men and Ships and Sealing Wax," revealing him an expert on sports, politics, trust making, high finance, filibustering, and many other things. He was also an intimate, personal friend of James G. Blaine.



Blank & Stoller, Inc.

Charles R. Flint

Mr. Flint retired twice from business, first in 1928. In 1930, however, tiring of inactivity he returned to his old offices, but quit definitely after a year.

He is survived by his second wife. Funeral services were held February 15 in the Mt. Pleasant Heights Presbyterian Church, Washington.

De Laval Executive

FOLLOWING a brief illness Frank W. Kennedy, vice president and general manager of the De Laval Steam Turbine Co., Trenton, N. J., died at his home at Yardley, Pa., on January 24, 1934. He was born at Pittsburgh, Pa., in 1876 and attended the Shadyside Academy and Princeton University, graduating from the latter a civil engineer in 1898.

Thereafter Mr. Kennedy held positions successively with the Pennsylvania Railroad, the U. S. Steel Corp., and the Dravo-Doyle Co. In 1908 he became general manager of the De Laval company and in 1916 vice president. He was also a director of that company and of the First Mechanics National Bank, Trenton; president and director of the American Bauer-Wach Corp.; and vice president of the Wilbur Trust Co. Other connections included membership in the executive committee of the Machinery Builders Society, the Society of Naval Architects and Marine Engineers, the Trenton Club, and the Trenton Country Club.

Veteran Reclaimer

CAPTAIN FRANCIS HAWKES APPLETON, senior past commander of the Ancient and Honorable Artillery Co. and long associated with the rubber reclaiming industry, died at his home in Franklin, Mass., February 9, 1934. A native of Jersey City, N. J., he was born August 4, 1853, and attended local public schools and Pennington Academy, Pennington, N. J.

For several years Captain Appleton was with a wholesale grocery house in New York, N. Y. Then for 16 years he served the Murphy Varnish Co., as bookkeeper, traveling salesman, and manager of its Boston branch, which he established.

In 1898 he started a rubber reclaiming factory at Franklin and in 1902 took in his son and namesake as partner, the firm being F. H. Appleton & Son, Inc. He maintained an office in Boston and had factories at Franklin and Lowell. He retired from active business some time ago.

In military and Masonic affairs Captain Appleton was very prominent, as a veteran of the 7th Regiment of New York and for more than 30 years a member of the Ancient and Honorable Artillery Company of Boston. One of a committee of 3, he went to England in 1912 to present King George V with an honorary membership in this famous organization.

Captain Appleton was a past potentate of Aleppo Temple, Mystic Shrine, and a member of Boston Commandery, Knights Templar; Algonquin, City, Commonwealth, Country, and Point Shirley clubs; the Boston Athletic Association; and the Massachusetts Charitable Mechanics Association.

In 1911-1912 he served as vice president of the Rubber Club of America and was also a charter member of the Rubber Reclaimers Club, of which he became president and treasurer. When this club was merged in the Reclaimers Division of the Rubber Association, he became chairman.

Captain Appleton is survived by his son, Captain Francis H. Appleton, Jr., and a grandson, F. H. Appleton 3d.

Private funeral services were conducted at Captain Appleton's home on February 13.

Machinery Man

A HEART attack on February 1 caused the death of Terz A. Seacrist, 59, one of the organizers and general manager of the Akron Gear & Engineering Co., Akron, O. He was also an Elk and a member of the K. of P. Lodge.

Surviving are his widow, a daughter, a son, and 3 sisters.

Funeral services were held on February 3. Interment was in Holy Cross Cemetery.

Crude Rubber Expert

HENRY FREY FLEISCHMANN, well known in the crude rubber trade as Henry Frey, died suddenly on January 22 after an operation in a New York, N. Y., hospital. He was born in Bloomington, Ill., on December 5, 1874, and came to New York as a child with his parents.

After attending the city's public schools he joined the shipping department of George A. Alden & Co., in 1892. He was with this firm and the New York Commercial Co. interests until 1913. From then on until his death he was with Charles E. Wood, Inc., 21 West St., New York, crude rubber importer, as its expert on the quality of rubber. Outside of business Mr. Fleischmann was keenly interested in all kinds of sports, especially football, baseball, socker, and hockey.

His widow and a son survive him.

Former Firestone Man

ROBERT E. LEE, former superintendent of labor with the Firestone Tire & Rubber Co., Akron, O., died in Akron on January 26. At the time of his death he was secretary of the Falls Paper Box Co., Cuyahoga Falls, O., and at one time had been superintendent of the Cincinnati Traction Co. During his lifetime Mr. Lee, who was born in Baltimore, Md., 66 years ago, served as vice president of the Akron Chamber of Commerce, as a member of the Ohio State Old Age & Health Commission, and as chief of the personnel staff of the quartermaster general's office, Washington, D. C. He was also a prominent Mason.

Surviving the deceased are 2 daughters and a son, Robert E. Lee, Jr., assistant superintendent of the Goodyear factory in Buenos Aires, Argentina.

Isaac Fineburg

ISAAC FINEBURG, 50, long with the Fineburg Tire & Accessory Co., Trenton, N. J., died February 10 in a Philadelphia hospital. He suffered a stroke about 10 years ago and recently had another one. Some years ago he owned the Trenton Scrap Rubber Co. Mr. Fineburg was a Rutgers University alumnus, a Mason, and an Elk.

Surviving him are 2 brothers and 6 sisters. Burial was in Trenton.

Edgar Whitehead

EDGAR WHITEHEAD, formerly of Trenton, N. J., died February 10 at New Orleans, where he was buried. The son of the late Joseph Whitehead, for many years head of Whitehead Bros. Rubber Co., Trenton, the deceased was with the company a number of years and later was a representative of the National Tube Co. Mr. Whitehead is survived by 4 sons.

Mogul Rubber Corp., Goshen, Ind., makes mechanicals, oil-well and mill supplies, sponge rubber, and molded specialties.

NEW ENGLAND

Robert C. Kelley, general purchasing agent of the Converse Rubber Co., Malden, Mass., recently gave the opening lecture in a course at Boston University when he spoke on "Purchasing and Stores Control."

The Gooch Rubber Co., 261 Franklin St., Boston, Mass., is now under the management of Chester W. Gooch.

The Fisk Rubber Corp., Chicopee Falls, Mass., recently increased wages 7 to 20% for nearly 80% of its 1,500 factory workers, who according to union officials are 97% organized. January production averaged 8,000 tires a day, and a somewhat greater number of tubes. President Edward D. Levy recently declared that Fisk sales from May 21, the date of the company's reorganization, to December 31, 1933, totaled about $6,375,000.

Omo Mfg. Co., Middletown, Conn., manufacturer of dress shields and specialties, at a recent annual meeting reelected officers and board as follows: president and treasurer, Frederick B. Fountain; vice president, Dale D. Butler; secretary, Frank E. Ferree; directors, company officers, Philip J. Stueck, Francis A. Beach, Earl R. Hudson, Richard J. Goodman, E. J. Paul, and James W. de Graff.

E. H. Clapp Rubber Co.'s plant at Hanover, Mass., was destroyed by fire February 17 with a loss estimated at $100,000.

MIDWEST

Seiberling Latex Products Co., recently transferred its Chicago, Ill., office from its former location at Michigan Ave. and 21st St. to the Merchandise Mart. Manager of the branch is Walter Meyer.

The B. F. Goodrich Rubber Co., Denver, Colo., branch at 2625 Walnut St., according to A. R. Bowlzer, of the sales promotion department, recently saw R. W. Mosena, former district operating manager and credit manager, transferred to the Pacific Coast. His credit responsibilities have been entrusted to C. A. Klumb, and E. J. O'Donnell was made division operating manager.

The Strang Tire Co., for 11 years at 229 Fifth St. W., Waterloo, Iowa, is moving to larger quarters at 617-19 Jefferson St., according to President Dewey Strang. The move will enable the firm to stock the United States tires and accessories more fully and offer service in all its branches. The company is also adding new lines, having been named distributer in 5 counties for the Prest-O-Lite storage batteries.

The New York Rubber Co. (of Illinois) recently moved its Chicago, Ill., headquarters from Cermak Rd. to 180 N. Wacker Dr., where G. L. Panushka is branch manager. In January, A. H. Benson, formerly of Chicago, returned there from the company's New York office, having been appointed manager of the Chicago division.

NEW JERSEY

Little change during the past month occurred in the New Jersey rubber industry. Many rubber manufacturers reported more business this winter than during the last one. Several New Jersey rubber officials recently attended the code meetings in New York, N. Y. Trenton manufacturers as a whole are living up to the NRA code, and have hired additional clerical help.

Luzerne Rubber Co., Trenton, anticipates an improved rubber situation in the spring. President Bruce Bedford resigned as a member of the Trenton Board of Education because of pressure of private business. He and Mrs. Bedford were at Miami Beach, Fla.

Puritan Rubber Co., Trenton, finds business improved over last winter's.

Essex Rubber Co., Trenton, pronounces present business very good, and officials are optimistic over the future. Sales Manager Lawrence M. Oakley recently celebrated his birthday.

Murray Rubber Co., Trenton, stated that the declining business during the past few weeks undoubtedly was due to the severe winter weather.

Whitehead Brothers Rubber Co., Trenton, owing to weather conditions during the past few weeks experienced increased business in its shoe department.

Pierce-Roberts Rubber Co., Trenton, continues with its night shift. Vice President Clifford A. Pierce recently visited Bermuda.

The Acme Rubber Mfg. Co., Trenton, reports unchanged business conditions. In accordance with the NRA the firm has engaged more clerical workers. President Horace T. Cook and Mrs. Cook are wintering at Mountain Lake, Fla.

Joseph Stokes Rubber Co., Trenton, now operates with day and night shifts. The plant at Welland, Ont., Canada, also is busy. President William J. B. Stokes continues to improve from his recent accident. Paul Gunkel, manager of the Canadian plant, who has been seriously ill, soon will leave Canada to recuperate in Georgia.

The Thermoid Co., Trenton, busy with many orders for the automotive industry, is working with 3 shifts daily and also with a force on Sunday. The company and its wholly owned subsidiaries, exclusive of Southern Asbestos Co. and eliminating intercompany sales, reported that January showed a 17% increase over December and that January sales were over 95% better than for the same month of 1933.

The Gates Rubber Co., Denver, Colo., supplied Vulco rope drives of 1,000 h.p. in the crushing plant of the Hudson River Stone Corp., located near Cold Spring, N. Y.

The Martin Rubber Co., manufacturer of rubber mats and specialties, moved to larger quarters at 1527 Kingsbury St., Chicago, Ill.

Rubber Industry in Europe

GREAT BRITAIN

Repairing Rubber Machinery

Formerly attempts to repair machinery and dies used in manufacturing rubber articles were rarely, if ever, successful since the awkward shape of the parts and the different thicknesses of the metal gave rise to serious distortions, or else new cracks developed when patched or welded parts began to cool. Today, however, these difficulties have been overcome, and repair welding by specialists has developed to the stage where the success of every job can be guaranteed. Huge and complicated pieces of machinery can be repaired in 2 to 3 days at comparatively small cost.

In this work of repair welding, Great Britain leads the world, says C. W. Brett, of Barimar Ltd., scientific welding engineer, in a recent article in the London *Rubber Age*. Experts can now not only repair, but if necessary, also reenforce broken and cracked parts of machinery so that the welded parts function as accurately as new parts would. By electro-deposition processes wear and tear in machinery can be compensated, and the diameter of a shaft, for instance, can be increased without altering the characteristics of the material of which it is made. By this method scored, pitted, or chipped rolls can be made like new again at a fraction of the cost of a new roll.

A new, low temperature welding process, extremely economical, is now used to repair small steel dies, cast-iron molds for retreading tires, and engine water jackets. Porosity in cylinders of hydraulic presses can be expertly and speedily corrected with self-contained, mobile welding plants. Steam boilers, drums, and pipes can be thoroughly overhauled, and even far-reaching reconstructions carried out without entailing shutdowns of more than 24 hours.

Institution of the Rubber Industry

Many prominent rubber men attended the twelfth annual meeting of the Institution of the Rubber Industry in London on January 12, 1934. Sir George Beharrell was reelected president; and the vice presidents also were reelected.

In his speech the president discussed conditions in America, particularly the NRA code for the rubber industry. He remarked that it seemed as though trade unionism was being placed around the neck of American industry to an extent which England had never even contemplated. He concluded with the statement that the British industry has much for which to be thankful in that it is in a position to decide for itself, and he did not think it would be told that it was unable to manage its own affairs.

Sir George then presented the Colwyn Gold Medal for 1934 to Prof. O. de Vries, of Holland, praising his great services to the rubber industry by his investigations in rubber at the Experiment Station of Buitenzorg, Java, work which has brought world renown to himself and to Buitenzorg. Dr. de Vries set up new standards of testing plantation rubber; his investigations did much toward further standardization of plantation rubber, and he was probably the first investigator in the East to consider seriously the aging qualities of vulcanized plantation rubber.

British Notes

A new wool and rubber fabric for upholstering automobiles recently was developed by the Wool Industries Research Association, Leeds. This fabric, it is claimed, offers several advantages which should help to open up a large field for it; thus it does not retain dust to the extent that the usual wool upholstery fabrics do; it can be produced more cheaply than leather; while the combination of wool and rubber would permit the use of other than mohair and luster wools, which are usually selected for carriage fabrics because of their durability. So far the new material has not yet been produced on a commercial scale, it seems; however experiments appear sufficiently advanced to have impressed automobile manufacturers in England, who, it is said, have promised to use the fabrics, when supplied, in their display of new models.

At the ninth annual meeting of the British Goodrich company, held in Manchester, the chairman, Sir Walrond Sinclair, stated that net profits for the past year were £109,165 against £87,742 the year before. An interim dividend of 2½% was declared last May, and now a further dividend of 4% was announced, making 6½% for the year against 5% for each of the preceding 3 years. During 1933 the company extended its factories at Leyland and Burton and furthermore acquired control of the Bristol Molded Hose Co., Ltd., Stepney Tire & Rubber Co., Ltd., and India Rubber, Gutta Percha & Telegraph Works Co., Ltd. The chairman of the last concern, B. H. Binder, in resigning, proposed the election of Sir Walrond since he felt that direct control would be best.

The Burton-on-Trent factory of Pirelli, Ltd., will manufacture rubber shoes. A new wing is to be added chiefly to store this footwear.

In recognition of the efforts of the Rubber Growers' Association and its associate company, Rubber Roadways, Ltd., the Federated Malay States Rubber Experimental & Propaganda Fund has made a substantial grant to the association toward defraying the cost of rubber paving for the Mersey Tunnel.

The Import Duties Advisory Committee notifies interested parties that an application has been received for increased duties on imported elastic cords, braids, webs, and other tissues, also similar materials containing rubber and textile material.

Among the British manufactures affected by the recently extended system of restricting imports into France are various kinds of rubber goods as elastic tissues and articles thereof; vulcanized rubber in sheet without tissue and not cut up or made up; rubberized fabric in the piece; hard rubber slabs, sheets, bars, rods, and insulators; covers and inner tubes for pneumatic tires; treads and solid tires for carriage wheels; soft rubber valves, joints, washers, etc.; and soft rubber or gutta-percha goods which are not elsewhere specified.

Germany

Gummi-Zeitung recently printed an analysis of the 1932-1933 balances of the leading rubber manufacturers in Germany, showing no real improvement in the financial condition of most companies. The best that can be said for the firms as a whole is that none that showed a profit in the preceding year had a loss in the year under review. While some concerns reduced their losses, and others again even increased profits, several firms show greater losses than in the year before.

What strikes the reader is the number of companies that have had to reduce their capital to cover losses or provide for special amortizations. Of 21 organizations listed 11 reduced their capital since 1930; last year alone 5 more firms also decreased their capital.

At first the position of reserves, when compared with capital, seems satisfactory until it is noticed that the increase

in reserves is only apparent, being for the most part produced by capital reductions, and that actual figures show a decrease in reserves.

Dividends neither increased nor decreased. Some of the medium and smaller concerns, as Blodner & Vierschrodt, Elbe, C. Muller, Vulkan, and Zieger & Wiegand, have managed to maintain their positions much better than the larger firms.

The Leipzig Spring Fair, to be held March 4-11, 1934, will exhibit the most varied types of drives for machinery in all branches of industry. A special attraction promises to be the new models based on latest experience, as developed by unemployed engineers.

Norddeutsche Gummiwarenfabrik Hannover, G.m.b.H., patented a door mat of rubber with elastic bristles. These mats come in brown and black and are washable and also said to be very durable.

The Wikrafa G.m.b.H., which sees to it that the price agreement between tire manufacturers is adhered to, appealed to the Kartel Court demanding that either the firm of Vorwerk & Sohn, Wuppertal Barmen, which also makes tires, join the tire agreement for 1934 or that a boycott of its tires be declared. But the Court rejected this motion. With regard to the Wikrafa's action against Michelin Deutsche Pneumatik A.G., Karlsruhe, the Kartel Court has as yet issued no decision on this matter.

Other European Notes

The Pe-pe-ge company of Graudentz, Poland, is raising its capital to 6,000,000 zloty by issuing 45,000 new shares of a nominal value of 100 zloty each. At the same time the original capital is to be cut 1,500,000 zloty to cover losses.

The firms Societe d'Exploitation des Anciens Etablissements J. B. Torrilhon, Chamaliere (Puy-de-Dome), and Etablissements Pax (Anciens Etablissements Destriez), Paris, both in France, have combined as Societe Nouvelle des Etablissements Torrilhon (Etablissements Torrilhon & Pax Reunis) with main offices at 47 Ave. Friedland, Paris. The capital has been raised to 13,000,000 francs by the creation of 25,000 new 500-franc shares of which 7,000 shares will be issued at par for cash; while 10,800 will be allotted the Torrilhon and 7,000 shares the Pax concerns.

The failure is reported of Societe des Etablissements Monrubel, manufacturer of all kinds of rubber goods, which had offices at Paris and a factory at Ivry (Seine). It was capitalized at 1,250,000 francs.

Imports of crude rubber into Sweden during 1933 showed a slight decrease as compared with 1932, the respective amounts having been 4,169,003 kilos against 4,334,007. On the other hand imports of most manufactured articles increased; thus heels and soles were 244,787 kilos against 161,701; inner tubes for bicycles and motor vehicles, 136,274 kilos against 88,092; belting, 251,971 kilos against 179,767; covers for automobiles and motor cycles, 1,358,255 kilos against 1,269,100; other parts, 195,297 kilos against 167,645; and rubber-soled footwear, 151,442 kilos against 68,282. But arrivals of rubber bicycle accessories other than tubes were 132,225 against 171,582 and of rubber footwear 122,786 kilos against 163,296. Rubber footwear exports declined from 629,389 in 1932 to 556,528; rubber-soled footwear from 173,620 kilos to 131,707; and hard rubber from 15,669 kilos to 10,900. Other rubber goods totaled 126,868 kilos in 1933 and 106,568 in 1932.

After the fire at the works of the A. S. Askim Gummivarefabrik, Askim, Norway, production was, to a certain extent, transferred to the factory in Mjondalen, where during the last quarter of 1933, 1,150 to 1,200 persons were working in 2 and 3 shifts. The new Askim factory will have a daily capacity of 15,000 pairs of rubber shoes. When this factory is completed, it is planned to reconstruct the works at Mjondalen particularly with a view to increased output of mechanical rubber goods. In addition, it is planned to make 6,000 pairs of rubber shoes daily. According to press reports foreign competition has greatly increased, especially from the East.

Gislaved, Ltd., Stamboul, Turkey, working with Swedish capital, is said now to be producing 3,500 pairs of rubber shoes daily. It further appears that the concern will manufacture tires.

EDITOR'S BOOK TABLE

Book Reviews

"Annuario delle Materie Plastiche. 1933/34, XII." Second Edition. Casa Editrice Pollini, Milan, Italy. (Italian). Cloth, 478 pages, 7 by 9½ inches. Illustrated. Index of materials and manufacturers of plastic moldings.

This work is a directory of manufacturers of mixing equipment, presses, and molds for stock products and specialties produced from plastic molding materials, together with lists of manufacturers of such articles.

"America Self-Contained." By Samuel Crowther, 1933. Doubleday, Doran & Co., Garden City, N. Y. Cloth, 340 pages, 5¼ by 8½ inches. Price $2.

In this book are disclosed many salient facts of American economic history in support of the thesis that the policy of economic nationalism will give America world independence in trade and finance. The country's disastrous experiences in internationalism during and since the Great War are arrayed in convincing arguments for the change. The part of technical resources in the new economic freedom is appreciatively set forth in the development of such essentials as dyes and synthetic rubber.

New Publications

The Vanderbilt News. R. T. Vanderbilt Co., Inc., 230 Park Ave., New York, N. Y. The January-February issue of this publication is devoted exclusively to the special compounding necessary to meet the severe service conditions under which automobile inner tubes must now function. Many sample high and low sulphur stocks are given with complete test data and graphs of physical properties and age resisting capacity.

"Cumar." The Barrett Co., 40 Rector St., New York, N. Y. This pamphlet describes the neutral, stable body, unique in the broad field of synthetic resins known as Cumar. Its range of industrial application is extensive and of special interest and importance to the rubber compounder because of the specific characteristics of its many grades and the perfection with which it blends with rubber.

"By-Laws and Rules." The Commodity Exchange, Inc., 81 Broad St., New York, N. Y. These "By-Laws and Rules" are contained in a loose-leaf binder. They are segregated under various headings indicated by guide cards according to the different commodities under their respective titles. The Commodity Exchange, Inc., was formed by the consolidation on May 1, 1933, of the 4 former New York exchanges for rubber, raw silk, hide, and the National Metal exchange.

"Operators' Hand Book. Goodrich Tires—Trucks and Buses, 1934 Edition." The B. F. Goodrich Co., Akron, O. In this convenient booklet the users of tires for every type of service will find full specifications, load and inflation tables for tires, tubes, air-containers, and valves; also data on solid and cushion tires and a handy table of weights of commodities commonly trucked in road vehicles.

"Tyer Druggist and Surgical Rubber Goods Catalog No. 1134." Tyer Rubber Co., Andover, Mass. This concern has consistently maintained the high quality of its products since the date of its establishment in 1856. The present catalog in colors and black and white displays an extensive line of modern rubber items for hospital, home, and office use. The company is also engaged in rubber covering rolls for manufactures of paper, textile, tannery, and leather industries.

Rubber Industry in Far East

MALAYA

Dunlop Plantations

In December, 1933, the planting correspondent of the *Straits Times* toured the various estates of Dunlop Plantations, Ltd., then gave his impressions in 4 articles. Dunlop Plantations, Ltd., the biggest rubber-planting concern in the Far East, was formed as a subsidiary of the Dunlop Rubber Co. in 1912, with an area of 4,932 acres. Today it has 9 estates totaling 101,053 acres, of which 49,992 acres are mature; 2,317 acres are immature, non-budded; 32,795 acres immature, budded; and 15,949 acres reserve land. These estates, in Malacca, Negri Sembilan, and Johore, are for the most part within a radius of 70 miles from headquarters.

Dunlop Plantations have the largest budded area of any owned by a single concern in Malaya, although budding was not started until 1929 when Dr. Cramer, former director of agriculture at Buitenzorg, Java, was hired. With the advice of this rubber-budding pioneer suitable clones were selected, and the 13 to 14 different clones now established are still considered among the best.

The oldest budded area, on Bahau Estate, consists of 430 acres planted in 1926 and budded in 1929. Tapping here was first started on an area representing 54 acres (allowing 100 tapping trees to the acre) on October 1, 1933, and the yield for the first month was at the rate of 500 pounds per acre per year; since then a further increase in yield has been noted. This area is of special interest as being one of the first, if not *the* first, monoclone budded area to be tapped on a commercial scale in Malaya. On this estate, too, is a 100-acre experimental section where about 500 different clones are being tested.

Dunlop's outstanding budding achievement, however, is found on Ladang Geddes, the largest of the 9 estates, which has a budded area of 13,379 acres. This estate, a total of 22,035 acres, was acquired in May, 1929, and before the end of December, 1930, the 13,379 acres mentioned above had been marked off into half-mile square blocks, felled, burned, lined, holed, and planted, and 18 months later it was all budded. Extensive sections have also been budded on the other estates, notably on Paya Lang and Sagil Estates (8,589 and 6,749 acres, respectively).

The cost of bringing the budded areas to the bearing stage was between £40 and £50 per acre, including all necessary roads, buildings, and factories. In about 2 years the larger areas will begin to reach the tapping stage, and it is calculated that before many years are past Dunlop will obtain over 50,000,000 pounds of rubber annually. At present the output from the unbudded area is 22,000,000 pounds so that the budded area alone is expected before long to yield almost ⅓ more than the present mature area; hence, says the writer, it is not unreasonable to assume that within the next 3 years or so, allowing full provision for depreciation and for increased labor rates, Dunlop will easily be able to produce at or below 2d. per pound.

The methods of preparing sheet on these estates is illustrated by the procedure at the central factory on Johol Estate, which serves 6,000 acres and treats 7,000 pounds of latex daily. On arrival at the factory the latex is bulked in a 4,000-gallon tank and then conveyed to 28 coagulating tanks. The next day the tanks, which have wheel bases and stand on circular rail tracks, are pushed close to the battery of 7 sheeting mills, and the coagulum is machined in continuous fashion. The sheet, arranged on tiered racks suspended from an overhead rail system, is left to dry for 24 hours, when the racks are brought to a steam-heated drying chamber by an overhead conveyer. The dried rubber, after being sorted, is packed in jute hessian bales; no wooden cases at all are used. The entire process, from reception of latex to completion of packing, takes 5 days against the average of at least a week or 10 days on most estates.

On Paya Lang Estate is Dunlop's central factory for concentrating latex, where 8 centrifugal machines treat 200,000 gallons of latex a month. After the latex reaches the factory, it is measured, conveyed into tanks holding 8,000 gallons, chemically tested, and sent through a pipe-line system direct to the centrifugal machines. After centrifugation the concentrated latex is conveyed by pipe-line to 2 underground storage tanks, each holding 25,000 gallons, and from here it again passes through pipelines either into railway tankers or steel barrels, ready for export. This entire process takes 24 hours, and although it appears simple enough, is both expensive and troublesome, it seems. Thus the factory, which began operating March, 1933, has so far cost £30,000. Power is obtained from 2 engines, one 75 and the other 50 h.p., but these will be replaced by 2 of 150 h.p. each. Then the centrifuging machines have to be dismantled almost completely and cleaned every 2 hours. The factory works day and night in 3 shifts and employs about 70 persons.

The steel barrels for shipping the concentrated latex, each containing 45 to 50 gallons, are made in the Dunlop factory on Paya Lang Estate, averaging about 25 an hour. At this estate, too, is Dunlop's own railway station.

Dunlop's total annual export of concentrated latex, in pounds, follows: 1929-1930, 1,238,858; 1930-31, 2,087,794; 1931-32, 4,793,813; 1932-33, 6,384,184.

Although the concern employs a scientist to advise on the best forestry methods suitable for special areas (old rubber in hilly sections) and the possibilities of rubber forestry are recognized, Dunlop nevertheless is cautious on this point and for the most part continues to follow a system of clean weeding and selected weeding.

Naturally, the slump caused a considerable reduction in the European staff, but those remaining work on very satisfactory terms regarding salary and leave. In addition, such unusual comforts as up-to-date bungalows with piped water are provided for all European members of the staff, and managers even have electric light. Furthermore, there are 5, 9-hole golf courses and recreation grounds. The 2,000 or so of coolies, including Chinese and Tamils, are also well treated; their lines are up-to-date; they have vegetable gardens; the Tamil children are provided with proper schooling; and finally is a well-equipped hospital with dispensary.

Plywood Rubber Cases

Much plantation rubber in the Far East is still shipped in packing cases of 3-plywood, and Malayan imports of these cases for a number of years totaled over 3,000,000 annually, representing a value, which together with that for other kinds of rubber cases and fittings, ran to between \$3,000,000 and over \$5,000,000 a year.

During 1931 and 1932, however, a sharp decline in these shipments is noted, which must be ascribed not so much to the slump and the search for cheaper methods of packing as to the increasing use of locally made cases. For since the first local factory for making plywood cases was established a few years ago in the Federated Malay States by Malayan Collieries, Ltd., their Malayply chests have been gaining ground steadily, and competition with imported cases has become keen.

The rising cost of materials will undoubtedly affect the price of imported

plywood cases, and the *Straits Times* learns that the Malayan firm mentioned is preparing to entrench itself deeper in the local market by offering special rates, not much above present levels to estates who assure it of support for the whole of 1934 or even for 6 months. Imports of these cases may, therefore, be expected to decline more.

The Federated Malaya States Agricultural Department publishes data showing that the most important foreign source of 3-plywood cases has been Finland, which in 1931 supplied chests to a value of $1,238,489; by 1932 this had dropped to $494,760. The shipments from the United Kingdom, $469,604 in 1931 and $381,829 in 1932 were better maintained; while those from Japan, $70,326 and $70,314, respectively, were practically unchanged. Fittings are supplied chiefly by France and Finland.

Netherlands East Indies

The pros and cons of manuring old Hevea were gone into by J. van Wamel, of Tjikadoe, at a recent meeting of the Bantam Planters' Association. His own experience showed that manuring for one or 2 years yielded little or no result in regard to increased outputs and that regular manuring is necessary to bring about such an increase, although even then the result may be disappointing.

The problem amounted to this: to what level can outputs on old and poorer areas be raised by artificial manuring, and does it pay? Taking the most favorable instance that an increase of 100% could be obtained by regular manuring for 5 years, could a yield of 500 kilos per bouw, for instance, be expected? But if this were possible, it would require the expenditure of 150 guilders per bouw to obtain a yield that was about half of what it is figured budded rubber should give. (Guilder=$0.402 U. S. currency. Bouw=1.754 acres.)

Under present conditions, on the other hand, it would not cost more than 150 guilders per bouw to replant the old area with first-rate planting material which would average crops never obtained by the old seedling plantation.

At Tjikadoe an experiment on these lines was started some years before in certain gardens where parts gave such poor yields that it did not pay to tap. The average output over all was about 160 kilos per bouw. At present certain sections replanted with seedlings produce 450 kilos per bouw, and others between 300 and 400 kilos per bouw. Figures for the area replanted with buddings are not yet available.

The data support van Wamel's conclusion that in most cases complete replanting of old areas is by far to be preferred to artificial manuring. Most of the planters at the meeting agreed that with prevailing prices for rubber manuring old rubber does not pay.

The Central Bureau of Statistics published the following preliminary figures on rubber exports for December, 1933.

Source	Estate Rubber Tons	Native Rubber Tons
Sambas	20	493
Pontianak	129	2,271
Bandjermasin	201	2,262
Palembang	137	2,934
Djambi	16	4,404
Belawan	4,868	59
Totals	5,371	12,423

These figures, plus 1,289 metric tons of latex, make the grand total for Sumatra and the Outer Provinces 19,083 tons.

The bureau also reported that the number of estates resuming tapping continues to increase, particularly in Java. At the end of November, 1933, the total tappable area still out of tapping had fallen to 14.3%, whereas in January, 1933, the percentage for all Netherlands East Indies had been 19.4%.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	Commodity	City and Country
*7,036	Canvas rubber-soled shoe machinery	Port Elizabeth, South Africa
*7,037	Belting	Shanghai, China
*7,039	Bath sponges and sponge mittens	Montreal, Canada
*7,040	Overshoes	Rio de Janeiro, Brazil
*7,096	Rubber goods	Tel Aviv, Palestine
†7,118	Belting	Turin, Italy

*Purchase. †Purchase and agency.

United States Latex Imports

Year	Pounds	Value
1931	10,414,712	$884,355
1932	11,388,156	601,999
1933		
Jan.	1,882,928	$100,900
Feb.	821,035	46,037
Mar.	1,207,608	55,731
Apr.	1,778,323	80,749
May	1,644,296	71,008
June	1,353,703	66,827
July	1,383,459	85,636
Aug.	2,589,838	196,138
Sept.	3,008,286	267,516
Oct.	3,495,689	310,531
Nov.	2,774,640	282,065
Dec.	2,890,056	270,533

Data from United States Department of Commerce, Washington, D. C.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1646	Manufacturer of transparent sheet rubber.
1647	Manufacturer of machines for cutting sole and heel blanks.
1648	Manufacturer of Phenolax.
1649	Manufacturers of machines for making rubber boots.
1650	Manufacturer of gutta percha tissue.
1651	Rubberizer of yarn cord.
1652	Who coats small pieces of metal with rubber.
1653	Manufacturers of zinc and aluminum stearates.
1654	Manufacturers of molded rubber products.
1655	Manufacturer of rubber thread.
1656	Manufacturer of a sponge rubber with a semi-hard rubber surface on one side at least.

Eastern and Southern

(*Continued from page 46*)

Smith Chemical & Color Co. through President C. Smith has announced the removal of its main office and warehouse from 28 Moore St., New York, N. Y., to its larger quarters at 55 John St., Brooklyn, N. Y.

Latex Fibers Industries, Inc., Beaver Falls, N. Y., has named Henry C. Avery, former vice president of Flintkote Corp., sales manager in charge of the new sales headquarters at 1790 Broadway, New York, N. Y. Latex Fibers Industries, Inc., owned by the United States Rubber Co. and J. B. Lewis Co., makes Laflex, Insolex, Lexhide, and other latex-fibrous combination materials.

American Chemical Society, 300 W. 42nd St., New York, N. Y., has scheduled the following meetings: eighty-seventh, St. Petersburg, Fla., March 25-30, 1934; eighty-eighth, Cleveland, O., September 10-14, 1934; eighty-ninth, New York, N. Y., week of April 22, 1935; and ninetieth, San Francisco, Calif.

The Harshaw Chemical Co. has moved from the eighth floor of the Chrysler Bldg., New York, N. Y., to rooms 3807 to 3810 in the same building.

Union Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y., has named A. B. Clark general traffic manager of its operating companies.

F. R. Henderson, 25 S. William St., New York, N. Y., issues weekly rubber reports to the trade, which include graphical charts giving the price fluctuations of May contracts and New York spot quotations for 1925-1934.

Georgia Webbing & Tape Co., Columbus, Ga., manufactures narrow fabrics including spinning and twister tape, webbing for mechanical uses, loop-edge wrapping tape, non-stretch webbing, tape fasteners, and tape sewing thread. Tapes for the rubber industry are loop-edge wrapping, and vulcanizing. J. R. Killian is president of the company; H. K. Park, vice president; C. A. Rhyne, treasurer; and W. B. Hope, secretary.

The Johnson-March Corp., maker of preservative paint for pipe lines, has moved its offices from 29-28 Hunter Ave., Long Island City, N. Y., to 52 Vanderbilt Ave., New York, N. Y. E. P. Wenzelberger is chief chemist.

Rubber Section Annual Survey

The Rubber Section of the Leather-Rubber-Shoe Division, United States Department of Commerce, Washington, D. C., making its annual survey of domestic consumption and stocks of crude and reclaimed rubber for 1933, has sent questionnaires to manufacturers for reports on their consumption and stocks and to reclaimers, importers, and dealers for their inventories. A complete consolidated report will be issued as soon as the survey is completed.

Patents and Trade Marks

MACHINERY

United States

1,939,670. **Vulcanizing Press.** P. De Mattia, Passaic, N. J., assignor, by mesne assignments, to National Rubber Machinery Co., Akron, O.

1,939,842. **Fabric Impregnator.** C. W. Crumb, Hazleton, Pa., and F. M. Sanders, Marysville, Mich.; said Crumb assignor to Oliver United Filters, Inc., San Francisco, Calif.; said Sanders assignor to St. Clair Rubber Co., Marysville, Mich.

1,939,852. **Glove Lining Form.** H. C. Howard, Akron, and E. A. Willson, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

1,939,871. **Hose Vulcanizer.** G. K. Bedur, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,939,894. **Cored Article Apparatus.** J. O. Goodwin, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,940,582. **Vulcanizing Press.** P. De Mattia, Passaic, N. J., assignor to National Rubber Machinery Co., Akron, O.

1,940,952. **Screen Plate.** E. Hutchens, assignor to Utility Mfg. Co., both of Cudahy, Wis.

1,941,016. **Die-Clearing Mechanism.** L. A. Mayle, Fremont, O.

1,941,099. **Material Handler and Cutter.** H. H. McGregor and K. E. Eck, assignors to Firestone Tire & Rubber Co., all of Akron, O.

1,941,114. **Tube Builder.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,942,311. **Inner Tube Drier.** C. Taarud, Sioux Falls, S. Dak.

1,942,398. **Embossed Article Apparatus.** F. D. Fowler, Newton, Mass., assignor to B. F. Goodrich Co., New York, N. Y.

1,942,498. **Hose Machine.** C. C. Spadone, Rockville Center, assignor to Spadone Machine Co., Inc., New York, both in N. Y.

1,942,519. **Pyrometer.** H. N. Packard, assignor to Cambridge Instrument Co., Inc., both of Ossining, N. Y.

1,942,639. **Stock Rack.** M. L. Engler and W. J. Breth, assignors to General Tire & Rubber Co., all of Akron, O.

1,942,986. **Jar Ring Cutter.** S. B. St. John, assignor to Black Rock Mfg. Co., both of Bridgeport, Conn.

1,942,993. **Ball Mold.** P. M. Aultman and A. C. Bowers, both of Greensburg, Pa., assignors to Pennsylvania Rubber Co., a corporation of Pa.

1,943,101. **Sponge Rubber Vulcanizer.** G. H. Wheatley, Fond du Lac, Wis.

1,943,133. **Die Placing and Shifting.** L. A. Mayle, Fremont, O.

1,943,736. **Doll's Head Apparatus.** S. Marcus, Belle Harbor, assignor to Margon Corp., New York, both in N. Y.

1,943,784. **Automatic Tire Spreader.** C. E. Branick, assignor to Branick Mfg. Co., Inc., both of Fargo, N. Dak.

1,943,947. **Tire Mold.** G. W. Bungay, Plainfield, N. J., assignor to Aluminum Co. of America, Pittsburgh, Pa.

1,943,996. **Inflatable Article Apparatus.** T. H. Williams, Akron, O., and C. S. Moomy, Carlisle, Pa., assignors to National Rubber Machinery Co., Akron, O.

1,944,142. **Wire Wrapper.** A. O. Abbott, Jr., Grosse Pointe Park, and G. K. McNeill, Detroit, assignors to Morgan & Wright, Detroit, all in Mich.

Dominion of Canada

337,966. **Tire Former.** H. Thorburn, Toronto, Ont.

United Kingdom

397,465. **Mold.** M. Van Roggen, Brussels, Belgium.

397,608. **Knitting Machine.** I. L. Berridge & Co., Ltd., S. L. Kilbourn, and C. S. Martin, all of Leicester.

398,475. **Tile Mold.** H. V. Whittaker, Eccles, and E. G. Latham, Manchester.

399,197. **Mask Mold.** J. A. Sadd, Porton, Wiltshire.

399,356. **Cushion Tire Mold.** M. and R. Baudou, both of Gironde, and J. Brunswick, Boulogne-sur-Seine, both in France.

399,850. **Rubber Mixer.** Dunlop Rubber Co., Ltd., London, and E. E. Quinton, Birmingham.

Germany

590,763. **Self-Acting Belting Mounter.** R. Weidermann, Moxa, Post Possneck i. Thur.

591,422. **Microporous Diaphragm Former.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands. Represented by C. Wiegand, Berlin.

591,502. **Dust Suction Device with Rubber Bearings.** Siemens-Schuckert Werke A.G., Berlin-Siemensstadt.

591,702. **Rubber Goods Former and Vulcanizer.** Dunlop Rubber Co., Ltd., London, England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a.M.

PROCESS

United States

1,939,843. **Splice Insulation.** E. H. Darby, deceased, by C. L. Darby, executrix, both of Rome, assignor to American Anode, Inc., New York, all in N. Y.

1,939,846. **Artificial Turf.** F. Fenton, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,939,878. **Weather Stripping.** E. E. Davidson, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,939,879. **Window Guide Channel.** E. E. Davidson, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,940,009. **Golf Balls.** A. Munro, Belleville, assignor to St. Mungo Mfg. Co. of America, Newark, both in N. J.

1,940,077. **Tire.** J. P. Coe, Yonkers, N. Y., assignor to Morgan & Wright, Detroit, Mich.

1,940,145. **Tubing.** P. A. Raiche, Providence, R. I., assignor to Davol Rubber Co., a corporation of R. I.

1,940,315. **Rubber Article.** E. E. McKay, assignor to Revere Rubber Co., both of Providence, R. I.

1,941,053. **Balls.** M. P. H. L. Raepsaet, Aurec-sur-Loire (Haute Loire), France, assignor to Societe Belge du Caoutchouc Mousse, Berchem-Ste.-Agathe lez Brussels, Belgium.

1,941,120. **Forming Shoe Socks.** D. F. Twiss and E. A. Murphy, both of Wylde Green, assignors to Dunlop Rubber Co., Ltd., Birmingham, all in England.

1,941,193. **Container.** L. E. Wells, Cleveland Heights, and E. Fairclough, Cleveland, assignors to Willard Storage Battery Co., Cleveland, all in O.

1,941,200. **Goods from Rubber Dispersions.** W. H. Chapman and D. W. Pounder, both of Birmingham, England, assignors to Dunlop Rubber Co., Ltd., a British company.

1,941,420. **Molded Product.** C. E. Siegfried, Sandusky, O., assignor, by mesne assignments, to Construction Materials Patents, Inc., a corporation of O.

1,941,912. **Non-Slipping Surface.** D. Repony, Clifton, assignor to Raybestos-Manhattan, Inc., Passaic, both in N. J.

1,942,425. **Furrier's Art.** P. Holman, Virginia, Minn.

1,942,683. **Printing Block.** B. C. Chambers, New York, N. Y., assignor to Wallace & Tiernan Products, Inc., Belleville, N. J.

1,942,797. **Preparing Tire Casings for Vulcanization.** C. E. Bittaker, assignor to General Tire & Rubber Co., both of Akron, O.

1,943,272, 1,943,273, 1,943,274, and 1,943,275. **Tire Bead.** W. G. Lerch, Akron, O., assignor, by direct and mesne assignments, to National-Standard Co., Niles, Mich.

1,943,381. **Rubber Thread.** J. R. Gammeter, Akron, O., assignor to Revere Rubber Co., Providence, R. I.

1,943,436, 1,943,437, 1,943,438, and 1,943,439. **Rubber Thread.** E. Hopkinson, New York, N. Y., assignor to National India Rubber Co., Providence, R. I.

1,943,917. **Tire Skidding Prevention.** W. Josky, Hamburg, Germany.

Dominion of Canada

337,765. **Printing Form.** H. Horn, Dresden, Germany.

337,961. **Rubber-Set Brush.** W. E. Smith, Edgware, England.

338,143. **Solid Dispersing Method.** Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignee of A. Szegvari, Akron, O., U. S. A.

338,171. **Rubber Article.** Durkee-Atwood Co., assignee of G. C. Brown, both of Minneapolis, Minn., U. S. A.

388,186. **Elastic Article.** Kendall Co., assignee of G. B. Meagher, both of Chicago, Ill., U. S. A.

338,267. **Latex-Impregnated Textile Product.** J. Duarry-Serra, Barcelona, Spain.
338,279. **Inflatable Rubber Goods.** J. H. Johnson, Toronto, Ont.
338,356. **Shoe Protecting Method.** Materials Protector Corp., Newark, N. J., U. S. A., assignee of R. Schneider and A. Poelman, co-inventors, both of Saint-Maurice, France.
338,372. **Rubber Thread.** Rubber Electro Deposition Patents, Ltd., London, England, assignee of W. A. Williams, Edinburgh, Scotland.

United Kingdom

397,419. **Rubber Thread.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. J. Joss, Bristol, R. I., U. S. A.
397,506. **Proofing Permeable Material.** B. D. Porritt, J. R. Scott, and Research Assn. of British Rubber Manufacturers, all of Croydon.
397,669. **Utilizing Waste Rubber.** M. L. Gomez, Teruel, Spain.
398,306. **Rubber.** T. J. Drakeley, London; F. H. Cotton, Hertfordshire; and D. Bridge & Co., Ltd., Manchester.
398,362. **Roller.** F. Griffiths, Salford, and D. Bamford, Middleton.
398,485. **Uniting Valve Parts to Tires.** Dunlop Rubber Co., Ltd., London, and P. R. Booth, Birmingham.
398,780. **Rubber Goods.** M. Dupret, Brussels, Belgium.
399,051. **Ornamenting Rubber.** B. F. Goodrich Co., New York, N. Y., assignee of C. W. Leguillon, Akron, O., both in the U. S. A.

Germany

590,910. **Process and Device for Making Tubes.** Anode Rubber Co. (England) Ltd., London, England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a.M., and T. R. Koehnhorn, Berlin.

CHEMICAL

United States

1,939,692. **Accelerator.** A. F. Hardman, assignor to Kelly-Springfield Tire Co., both of Cumberland, Md.
1,940,053. **Colored Rubber.** W. Hentrich, Erlangen, M. Hardtmann, Naunhof, and P. Backes, Rheydt, all in Germany, assignors to General Aniline Works, Inc., New York, N. Y.
1,940,280. **Accelerator.** I. Williams and A. M. Neal, assignors to E. I. du Pont de Nemours & Co., all of Wilmington, Del.
1,940,528. **Rubber Composition.** A. E. Bond, Seven Kings, assignor, by direct and mesne assignments, to Rubber Cement Products, Ltd., London, both in England.
1,940,815, 1,940,816, 1,940,817, 1,940,818, and 1,940,819. **Age Resister.** W. L. Semon, Cuyahoga Falls, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,940,824. **Age Resister.** A. W. Sloan, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,941,012. **Age Resister.** W. N. Jones, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,941,142. **Accelerator.** W. P. ter Horst, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.
1,941,146. **Accelerator.** M. W. Harman, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.
1,941,437. **Gasket Compound.** H. H. Jordan, Manheim Township, assignor to Armstrong Cork Co., Lancaster, both in Pa.
1,941,691. **Vulcanization Method.** L. G. Jenness, Brooklyn, N. Y., assignor to St. Mungo Mfg. Co. of America, Newark, N. J.
1,942,790. **Accelerator.** E. Zaucker and M. Bögemann, both of Cologne-Mulheim, and L. Orthner, Leverkusen-I. G. Werk, assignors to I. G. Farbenindustrie A.G., Frankfurt a.M., all in Germany.
1,942,853. **Rubber Master Batch.** W. F. Zimmerli, Portage Township, and W. L. Semon, Cuyahoga Falls, both in O., assignors to B. F. Goodrich Co., New York, N. Y.
1,943,423 and 1,943,424. **Rubber Adhesive.** W. W. Dunfield, Yonkers, N. Y., assignor to Naugatuck Chemical Co., Naugatuck, Conn.
1,943,570. **Accelerator.** C. S. Williams, Woodbury, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
1,943,797. **Accelerator.** J. R. Ingram, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

Dominion of Canada

337,928. **Collector Ring Compound.** I. Q. Gurnee, Butler, N. J., U. S. A.
338,019. **Accelerator.** Goodyear Tire & Rubber Co., Akron, assignee of L. B. Sebrell, Silver Lake, and A. M. Clifford, Stow, co-inventors, all in O., U. S. A.
338,331. **Asphaltic Coating Composition.** Canadian Industries, Ltd., Montreal, P. Q., assignee of H. J. Barrett, Wilmington, Del., U. S. A.
338,412. **Chlorinated Rubber.** E. Konrad and F. Schwerdtel, co-inventors, both of Leverkusen-I. G. Werk, Germany.

United Kingdom

397,374. **Rubber Composition.** E. J. J. Knight, Small Dole, Sussex.
397,508. **Tire Vulcanization.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
397,676. **Leather-Rubber Composition.** P. Meyersberg and G. Wolf, both of Bratislava, Czechoslovakia.
397,997. **Coating Composition.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and E. A. Murphy and D. N. Simmons, both of Birmingham.
398,006. **Rubber Compound.** H. J. Prins, Hilversum, Holland.
398.319. **Fibrous Composition.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and E. A. Murphy, Birmingham.
398,349. **Porous Rubber Composition.** J. Neuhaus, Brück, Germany.
398,477. **Rubber Paint.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allgemeine Elektricitäts-Ges., Berlin, Germany.
398,547. **Fibrous Composition.** J. J. Bamberger, Middlesex.
398,702. **Rubber Composition.** H. G. C. Fairweather, London. (R. J. King Co., Inc., Stamford, Conn., U. S. A.)
398,759. **Abrasive Composition.** Anaconda Copper Mining Co., New York, N. Y., assignee of C. E. Yates, Perth Amboy, N. J., both in the U. S. A.
399,009. **Rubber Composition.** V. Kaufmann, Mannheim, Germany.
399,147. **Bituminous Rubber Composition.** J. Lightfoot, Accrington.
399,173. **Gas Inflating Material.** Imperial Chemical Industries, Ltd., London, and W. R. Cousins, Cheshire.
399,213. **Dipped Goods.** Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands, assignee of V. J. Sprunger, Akron, O., U. S. A.
399,229. **Rubber Composition.** H. Morser, London.
399,277. **Latex Composition.** E. V. Hayes-Gratze, London.
399,370. **Latex.** A. Nyrop and Koefoed, Hauberg, Marstrand, & Helweg Aktieselskabet Titan, both of Copenhagen, Denmark.
399,394. **Latex Coating Composition.** Accumulatoren-Fabrik A.G., Berlin, Germany.
399,684. **Latex Composition.** L. d'Antal, Budapest, Hungary.
399,781. **Synthetic Rubber Composition.** Felten & Guilleaume Carlswerk A.G., Cologne, Germany.
399,856. **Latex Composition.** W. J. Tennant, London. (Behr-Manning Corp., Troy, N. Y., U. S. A.)
399,868. **Coating Composition.** D. Traill, Ayrshire, and Imperial Chemical Industries, Ltd., London.
399.870 and 399,871. **Latex Composition.** Dewey & Almy, Ltd., London.

Germany

590,685. **Rubber Solutions.** Firma E. Merck, Darmstadt.
591,905. **Porous Rubber from Aqueous Dispersions.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands. Represented by C. Wiegand, Berlin.
591,951. **Vulcanized Rubber Goods.** W. B. Wiegand, New York, N. Y., U. S. A. Represented by G. Knoth, Hamburg.

GENERAL

United States

1,939,649. **Fountain Pen.** L. H. Ashmore, Collingswood, assignor to Esterbrook Steel Pen Mfg. Co., Camden, both in N. J.
1,939,753. **Fountain Pen.** E. S. Wood, Cinnaminson Township, assignor, by direct and mesne assignments, to Esterbrook Steel Pen Mfg. Co., Camden, both in N. J.
1,939,838. **Insect Destroyer.** J. G. Wasson, Canton, Ill.
1,939,848. **Resilient Motor Support.** F. L. Haushalter, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,939,855. **Engine Vibration Damper.** O. C. Kreis, assignor to Continental Motors Corp., both of Detroit, Mich.
1,939,859. **Driving Belt.** G. L. Matthias, Silver Lake, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,939,867. **Receptacle.** A. W. Thompson, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,939,872. **Flexible Hose Coupling.** G. K. Bedur, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,939,875. **Cable.** V. Bush, W. Medford, Mass.
1,939,920. **Horseshoe Bottom Tread.** G. Rigante, Westerleigh, Staten Island, N. Y.
1,939,948. **Roll.** C. Berlow, assignor to American Wringer Co., both of Woonsocket, R. I.

1,939,968. **Flexible Post.** J. Frei, Jr., Chicago, Ill.
1,940,074. **Pipe Joint.** J. H. G. Burmeister, Hamburg, Germany.
1,940,104. **Handle Covering.** G. E. Russell and H. I. Diamond, both of Atlanta, Ga.
1,940,210. **Faucet Syringe.** J. M. Fredcrick, assignor to J. L. Rosenfield, both of Baltimore, Md.
1,940,302. **Oscillating Joint.** C. L. Humphrey, Detroit, and R. K. Lee, Highland Park, assignors to Chrysler Corp., Detroit, all in Mich.
1,940,330. **Shock Absorbing Mounting.** A. J. Sinclair and J. W. Sailler, assignors to Chrysler Corp., all of Detroit, Mich.
1,940,361. **Headrest.** A. J. May, assignor to Ritter Dental Mfg. Co., Inc., both of Rochester, N. Y.
1,940,511. **High Voltage Conductor.** H. D. Rice, assignor to National India Rubber Co., both of Bristol, R. I.
1,940,542. **Shoe with Rubber Inlets.** I. Goth, Berlin, Germany.
1,940,546. **Dustpan.** J. B. Hower, Akron, O.
1,940,608. **Figure Toy.** F. H. Schavoir, Stamford, Conn.
1,940,640. **Refrigerating Apparatus.** J. T. Rauen, assignor to Frigidaire Corp., both of Dayton, O.
1,940,686. **Vibration Dampening Mounting.** H. C. Lord, Erie, Pa.
1,940,767. **Sewing Machine Die Stamping Attachment.** R. O. Perkins, Cleveland, O.
1,940,868. **Compound Tubular Fabric.** J. A. Kennedy, Pawtucket, R. I., assignor to Anaconda Wire & Cable Co., New York, N. Y.
1,940,884, 1,940,885, and 1,940,886. **Universal Joint.** R. H. Rosenberg, Detroit, Mich., assignor to Budd Wheel Co., Philadelphia, Pa.
1,940,895. **Internal Combustion Engine.** H. E. Wacker, assignor to Packard Motor Car Co., both of Detroit, Mich.
1,941,071. **Container and Closure.** D. E. Baxter, Los Angeles, Calif.
1,941,148. **Printing Plate.** G. R. Keltie, assignor to American Wringer Co., Inc., both of Woonsocket, R. I.
1,941,249. **Inflater and Pressure Gage.** J. C. Crowley, Cleveland Heights, assignor to Dill Mfg. Co., Cleveland, both in O.
1,941,380. **Motor Vehicle Brake.** L. X. Antelme and L. Trescartes, both of Paris, France.
1,941,399. **Hydraulic Buffer with Door Closer.** C. Ischebeck, Vorde, assignor to K. Maste, Iserlohn, both in Germany.
1,941,401. **Corset.** M. Kahn, Cedarhurst, N. Y.
1,941,441. **Container Closer with Dispenser.** C. R. Miller, assignor to Eli Lilly & Co., both of Indianapolis, Ind.
1,941,505. **Combination Garment.** H. Wipperman, assignor, by mesne assignments, to H. W. Gossard Co., both of Chicago, Ill.
1,941,549. **Toilet Tank Valve.** P. C. Gannon, Pittsburgh, Pa.
1,941,699. **Sock Suspender.** H. Löffler, Duisburg, Germany.
1,941,713. **Foot Corrective Device.** R. V. Parsons, Johnstown, Pa.
1,941,746. **Stock Receptacle.** M. E. Hill, assignor to Holfast Rubber Co., both of Atlanta, Ga.
1,941,853. **Shoe.** M. Colavito and J. S. Merenna, both of Brooklyn, N. Y.
1,941,872. **Friction Facing.** H. Abert, New York, N. Y., assignor to Raybestos-Manhattan, Inc., Passaic, N. J.
1,941,877. **Exercising Ball.** L. F. Brazeau, assignor of ¼ to P. Palmblad, and ¼ to H. T. Bates, all of Portland, Ore.
1,941,995. **Rubber Spring.** W. H. Mussey, Chicago, Ill., assignor, by mesne assignments, to Pullman Car & Mfg. Corp., a corporation of Del.
1,941,996. **Equalizer Seat Cushion.** W. H. Mussey, Chicago, Ill., assignor, by mesne assignments, to Pullman Car & Mfg. Corp., a corporation of Del.
1,942,001. **Shoe.** C. F. Rohn, Whitefish Bay, and F. A. Rohn, Milwaukee, both in Wis.
1,942,008. **Typewriter.** J. A. B. Smith, Stamford, Conn., assignor to Underwood Elliott Fisher Co., New York, N. Y.
1,942,018. **Resilient Wheel.** L. W. Blackwood, Spokane, Wash.
1,942,116. **Blow-out Patch and Plug.** T. W. Mullen, El Dorado, Ark.
1,942,252. **Fly Swatter.** J. L. Martin, Thornbury, Victoria, Australia.
1,942,296. **Cushion.** E. B. Killen, London, England.
1,942,305. **Typewriter.** J. L. Petz, assignor to Electromatic Typewriters, Inc., both of Rochester, N. Y.
1,942,366. **Casing Head Equipment.** L. M. C. Seamark, St. Just, England.
1,942,394. **Goggles.** N. M. Baker, assignor to American Optical Co., both of Southbridge, Mass.
1,942,489. **Gasket.** G. H. Pfefferle, assignor to S. R. Dresser Mfg. Co., both of Bradford, Pa.
1,942,719. **Toy.** Y. Mikamo and I. Koda, both of Watsonville, Calif.
1,942,721. **Flexible Connection.** L. Q. Moffitt, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,942,829. **Vehicle Brake Hose.** A. D. Pentz, New York, assignor to Pentz Motor Brake Corp., New Brighton, both in N. Y.
1,942,867. **Airplane Deicer.** C. W. Leguillon, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,942,882. **Milking Apparatus.** A. Sutherland, Vancouver, B. C., Canada.
1,942,883. **Pneumatic Shoe.** A. Schäffer, Veliki-Beckerek, Yugoslavia.
1,942,959. **Inflatable Article Valve.** F. Fenton, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,942,976. **Body Support.** W. R. Popkess, Sabetha, Kan.
1,943,048. **Fountain Pen.** J. Wallace, Brooklyn, N. Y.
1,943,237. **Advertising Device.** R. H. Harrington, assignor to General Tire & Rubber Co., both of Akron, O.
1,943,365. **Bath Sponge.** C. R. C. Borden, Brookline, Mass.
1,943,435. **Expansion Pulley.** J. R. Hertenstein, assignor to Nashville Machine & Supply Co., both of Nashville, Tenn.
1,943,448. **Waterproof Footwear.** H. P. Manville, Woodbury, assignor to Goodyear's India Rubber Glove Mfg. Co., Naugatuck, both in Conn.
1,943,547. **Motor Vehicle.** C. R. Paton, Birmingham, assignor to Packard Motor Car Co., Detroit, both in Mich.
1,943,588. **Roof Structure.** H. J. Dinstbir, Butler, Pa.
1,943,785. **Fountain Pen.** J. M. Burroughs, Tipton, Iowa.
1,943,792. **Eraser.** K. A. Garvey, assignor to Wahl Co., both of Chicago, Ill.
1,943,818. **Wire Coating Apparatus.** C. B. Fantone, Lyndhurst, and R. M. Jameson, Teaneck, assignors to Syncro Machine Co., Arlington, all in N. J.
1,943,887. **Airplane Shock Absorbing Strut.** R. E. Dowd, Staten Island, N. Y., assignor to Russell Mfg. Co., Middletown, Conn.
1,943,910. **Goggles.** N. M. Baker, assignor to American Optical Co., both of Southbridge, Mass.
1,943,915. **Steering Wheel.** H. D. Geyer, assignor to Inland Mfg. Co., both of Dayton, O.
1,944,101. **Door Buffer.** E. Meier, Oakland, Calif.
1,944,108. **Electrically Heated Atomizer.** J. Robinson, New York, N. Y.

Dominion of Canada

337,766. **Boot and Shoe Upper.** R. W. Hutchings, Bristol, England.
337,770. **Garment.** F. H. Lewis, New York, N. Y., U. S. A.
337,860. **Railway Vehicle Wheel Set.** La Société Anonyme des Pneumatiques Dunlop, assignee of E. Pepinster, both of Paris, France.
337,872. **Vacuum Cleaner.** B. F. Sturtevant Co., Boston, assignee of G. W. and L. B. Allen, co-inventors, both of Hyde Park, all in Mass., U. S. A.
337,874. **Draft Rigging.** Symington Co., New York, assignee of D. S. Barrows, Rochester, both in N. Y., U. S. A.
337,883. **Shoe Tree.** United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., assignee of H. Hallam, Leicester, England.
337,894. **Plug and Socket.** F. W. Hudson, San Francisco, inventor, and A. W. McClary, Oakland, assignee of ½ of the interest, both in Calif., U. S. A.
337,956. **Electrical Connector.** E. F. Schmidt, Spokane, Wash., U. S. A.
338,083. **Gold Saving Machine.** D. A. Silver, Goldendale, and J. W. Silver, Tacoma, co-inventors, both in Wash., U. S. A.
338,243. **Continuous Film Processer.** Western Electric Co., Inc., New York, N. Y., assignee of J. Crabtree, E. Orange, N. J., both in the U. S. A.
338,287. **Foundation Garment.** L. I. Malmstead, Worcester, Mass., U. S. A.
338,306. **Writing Machine Platen Roll.** J. Q. Sherman, Dayton, O., U. S. A.
338,316. **Electric Battery.** M. Wilderman, Monte Carlo, Monaco.
338,333. **Windshield Wiper.** Christen Products Co., assignee of V. H. Christen, both of Detroit, Mich., U. S. A.
338,373. **Sheet Rubber Product.** Seamless Rubber Co., Inc., assignee of W. W. DeLaney, both of New Haven, Conn., U. S. A.

United Kingdom

397,347. **Kite Balloon.** J. Letourneur, Versailles, France.
397,488. **Pipe Joint.** L. Rado, Berlin, Germany.
397,582. **Sanitary Device.** H. Souchard, Royan, France.
397,591. **Life Belt.** O. D'Alessandro, Monte Carlo, Monaco.
397,736. **Fountain Pen.** M. Chelazzi and D. Frulli, both of Genoa, Italy.
397,754. **Sifting Apparatus.** Soc. Anon. Ateliers J. Hanrez, Monceau-sur-Sambre, assignee of Soc. Anon. Mecanique & Outillage, Sclessin, both in Belgium.
397,896. **Fluid Pressure Brake.** Dun-

lop Rubber Co., Ltd., London, and E. F. Goodyear, J. Wright, and H. Trevaskis, all of Coventry.

397,917. **Inflating Valve.** Avon India Rubber Co., Ltd., and O. F. Swanborough, both of Melksham.

397,944. **Ball.** St. Mungo Mfg. Co., Ltd., R. C. Swabey, and G. Bottomley, all of Glasgow, Scotland.

398,041. **Exerciser.** A. H. Kempson, Birmingham.

398,285. **Loose-Leaf Binder Locker.** Shaw & Sons, Ltd., and F. E. T. Fox, both of London.

398,296. **Tire Deflation Indicator.** J. Roscoe and P. Stevenson, both of Litherland.

398,301. **Brake.** Dunlop Rubber Co., Ltd., London, and E. F. Goodyear and J. Wright, both of Coventry.

398,328. **Accumulator Grid Paster.** W. J. Tennant, London. (Monark Battery Co., Inc., Chicago, Ill., U. S. A.)

398,420. **Surgical Suction Appliance.** E. Weigel, Pforzheim, Germany.

398,429. **Vulcanizer Presser Belt.** G. Roese, Stettin, Germany.

398,447. **Door Stop.** E. Wieland, Zürich, Switzerland.

398,559. **Refrigerator.** O. M. Seemann, London.

398,580. **Ball.** Dunlop Rubber Co., Ltd., and L. V. Kenward, both of London.

398,584. **Sleeping Bag.** W. B. Tidman, London.

398,630. **Accumulator.** R. Bosch A. G., Stuttgart, Germany.

398,654. **Swimming Appliance.** B. E. Lehmann and R. A. Buist, both of London.

398,657. **Machine Insulating Support.** H. Stossel, Berlin, Germany.

398,675. **Suction Denture.** L. M. Valbuena, New York, N. Y., U. S. A.

398,681. **Plug.** British Thomson-Houston Co., Ltd., London, assignee of G. B. Benander, Yalesville, Conn., U. S. A.

398,688. **Terminal Mounting.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Elektrizitats A. G. Hydrawerk, Berlin, Germany.

398,691. **Compression Machine.** Sulzer Frères Soc. Anon., Winterthur, Switzerland.

398,711. **Paper Bag.** Norsk Hydro-Elektrisk Kvaelstofaktieselskab, Oslo, Norway.

398,718. **Stocking Protector.** G. Laurer, Nuremberg, Germany.

398,721. **Golf Club.** A. G. Spalding & Bros. (British), Ltd., London, assignee of W. F. Reach, Springfield, Mass., U. S. A.

398,749. **Eyelash Curler.** W. R. Tuttle and C. W. Stickel, both of Rochester, N. Y., U. S. A.

398,751. **Electrolytic Cell.** K. Kaisser, Munich, Germany.

398,772. **Accumulator.** R. Bosch A. G., Stuttgart, Germany.

398,778. **Motor Support.** J. J. Hambidge, W. J. Frame, and British Vacuum Cleaner & Engineering Co., Ltd., all of London.

398,788. **Spray Producer.** O. Treichel and Minimax A. G., both of Berlin, Germany.

398,791. **Power Hydraulic Transmission.** L. Freimark and F. Hagenmann, both of Munich, Germany.

398,811. **Cable.** Greengate & Irwell Rubber Co., Ltd., and R. Povey, both of Manchester.

398,814. **Accumulator.** Britannia Batteries, Ltd., London, assignee of Accumulatoren - Fabrik A. G., Berlin, Germany.

398,910. **Sewing Machine.** I. Gonyk, Vienna, Austria.

398,919. **Teeth Cleaner.** C. E. Denney, Brighton.

398,928. **Web Feeder.** L. Mellersh-Jackson, London. (Goss Printing Press Co., Chicago, Ill., U. S. A.)

398,954. **Loom Shuttle.** A. E. Newsholme and C. W. Metcalfe, both of Haworth.

398,971. **Electric Lamp Holder.** R. Nettl, Cheadle Hulme.

398,972. **Typewriter Case.** Royal Typewriter Co., Inc., New York, N. Y., assignee of B. J. Dowd, W. Hartford, Conn., both in the U. S. A.

398,995. **Ruler.** W. A. Harvey, London.

398,999. **Electric Cord.** United Elastic Corp., Easthampton, Mass., U. S. A.

399,015. **Bowling Ball.** A. Read, Stafford.

399,021. **Air Cushion.** T. O'Loughlin, Belleek, Co. Fermanagh, Northern Ireland.

399,072. **Handle.** Soc. Francaise B. F. Goodrich, Colombes, France.

399,091. **Hot Water Bottle.** A. Blum, Vienna, Austria.

399,154. **Damped Resilient Drive.** C. L. Richards and Baird Television, Ltd., both of London.

399,161, 399,168, and 399,169. **Reciprocating Engine Mounting.** Chrysler Corp., Detroit, Mich., U. S. A.

399,200. **Bobbin.** G. W. Bowen and E. A. Lawson, both of Lyndonville, Vt., U. S. A.

399,259. **Suspended Lamp.** J. Keith & Blackman Co., Ltd., and G. Keith, both of London.

399,288. **Wireless Receiver.** W. H. Grimditch, Glenside, Pa., U. S. A.

399,296. **Loudspeaker Coil - Former.** Rola Co., Cleveland, assignee of B. A. Engholm, Lakewood, both in O., U. S. A.

399,312. **Cycle Lamp Mounting.** E. Lycett and F. J. Urry, both of Birmingham.

399,343. **Dispensing Stopper.** P. Wurzburger, Paris, France.

399,352. **Liquid Aerating Device.** N. Meurer, Cologne, Germany.

399,390. **Respirator.** J. De St. Rapt and G. Decombe, both of Lyons, France.

399,414. **Wringer.** L. Höhn, Schwelm, Germany.

399,422. **Safety Razor.** F. B. Dehn, London. (J. W. Harris, Los Angeles, Calif., U. S. A.)

399,426. **Printing Press Inker.** Maschinenfabrik Winkler, Fallert, & Co. A. G., Berne, and M. Klimroth, Wabern, both in Switzerland.

399,496. **Gas Mask.** J. A. Sadd, Porton, Wiltshire.

399,531. **Massage Apparatus.** E. G. S. Hawkins, Brighton.

399,545. **Knitted Fabric.** Hemphill Co., Central Falls, assignee of R. H. Lawson, Pawtucket, and A. N. Cloutier, Lonsdale, all in R. I., U. S. A.

399,578. **Veneering Press.** A Schüchker, K. Bauer, and K. Vavra, all of Vienna, Austria.

399,591. **Knitted Fabric.** J. Rompler A. G., and C. Baumgärtel, both of Zeulenroda, Germany.

399,596. **Massage Appliance.** C. Mountford, Redditch.

399,698. **Wrist Watch Strap.** F. Salzsieder, Lindenthal, Germany.

399,788. **Bandage.** F. J. Farrell and Grout & Co., Ltd., both of Great Yarmouth.

399,903. **Paint Can.** F. Walton, Bedford.

399,912. **Horse Race Starting Barrier.** W. R. Dalton, London.

399,935. **Boot.** P. B. Gifford, Newton Stewart, Scotland.

399,936. **Stereotype Matrix.** S. W. H. Long, M. Graham, London Express Newspaper, Ltd., and Dunlop Rubber Co., Ltd., all of London.

399,940. **Sponge Rubber Particles.** Dunlop Rubber Co., Ltd., London, and F. J. Payne, E. W. Madge, and W. G. Gorham, all of Birmingham.

399,972. **Draught Excluder.** Worcester Windshield & Casements, Ltd., and A. E. E. Jones, both of Worcester.

Germany

590,700. **Heel.** H. Potschkat, Berlin.

590,878. **Medicinal Syringe.** Bornkessel Brenner & Glasmaschinen G.m.b.H., Berlin-Frohnau.

590,891. **Tire.** Auto-Rader & Felgenfabrik Max Hering A.G., Ronneburg i. Thur.

590,975. **Heel.** Vorwerk & Sohn, Wuppertal-Barmen.

591,034. **Tire.** R. Gerhard, Saarbrucken, and A. Gaffga, Louisenthal, Saar.

TRADE MARKS

United States

308,543. **Brunch Costumes.** Women's wearing apparel including footwear, bathing shoes and caps, girdles, and garter belts. Louise Barnes Gallagher, Inc., New York, N. Y.

308,566. Fanciful design before and after the word: **"Bolta."** Combs. Glemby Co., Inc., New York, N. Y.

308,768. **Firestone Hispania.** Tires and tubes. Firestone Tire & Rubber Co., Akron, O.

308,772. Tag containing representation of 2 men in a forest, and the words: **"Robin Hood Liquid Latex."** Prophylactic membranous articles. Julius Schmid, Inc., New York, N. Y.

308,811. **Texaco.** Raincoats and boots. Texas Co., New York, N. Y.

308,823. **Lusterbryte.** Water-wax for rubber, etc. U. S. Sanitary Specialties Corp., Chicago, Ill.

308,852. Black circle containing the initials and the number: **"CS-3."** Carbon black. General Atlas Carbon Co., New York, N. Y.

308,853. Square containing the word: **"Pelletex."** Carbon black. General Atlas Carbon Co., New York, N. Y.

308,887. **"Bonnie Scot . .** Golf balls. Golf Ball, Inc., Chicago, Ill.

308,888. **Crescent Flyer.** Golf balls. Golf Ball, Inc., Chicago, Ill.

308,889. **Heather Champ.** Golf balls. Golf Ball, Inc., Chicago, Ill.

308,890. **Kiltie King.** Golf balls. Golf Ball, Inc., Chicago, Ill.

308,891. **Plaid King.** Golf balls. Golf Ball, Inc., Chicago, Ill.

308,892. **Tip Top.** Golf balls. Golf Ball, Inc., Chicago, Ill.

308,972. **Oilex.** Stuffing box packing. La Favorite Rubber Mfg. Co., Hawthorne, N. J.

308,974. Representation of a cross-sectional view of a tire consisting of a narrow yellow band between other plies of the tire. Pneumatic tires. B. F. Goodrich Co., New York, N. Y.

Market Reviews

CRUDE RUBBER

RESTRICTION is still hanging over the market. Early in the month it looked almost certain, but observers were disappointed. The delay was due to difficulty in determining how to control native production in the Dutch East Indies.

Dr. H. Colijn, premier and Dutch colonial minister, next made a flying visit to London which had the wires buzzing, but he gave no information in return. Those who attended a recent meeting were required to take an oath not to reveal what happened, even to their intimates, or so went the report.

The net result is to put restriction right where it was last month. Probably every trader in this market believes it is on the way, but those who expected to see it come by April 1 are now extending that date.

While this discussion goes on; so does production. Native and estate output have been large for the last 12 months. But with restriction apparently closer, the rate has been stepped up until even an unexpectedly large consumption like the 40,413 tons taken here in January does not meet imports. It will be some time, even after the good news is finally broadcast, before machinery can be set up to control output, and production will pile up in the interim. Still, the saying now getting to be an old saw is truer than when it was first said: the more production is increased, the more urgent is the need of restriction.

Forgetting restriction, however, there is cause for hope in the automobile and tire industries. Production is proceeding at a splendid rate, with several factories getting back into their old-time stride. Wages have been increased; tire factories are going back on a 6-day week; one company increased tire prices; and the higher cost of raw materials and labor make it seem inevitable that a substantial increase in tire prices should be forthcoming. Demand for tires has been unusual for this time of the year.

Automobile activity is no less unusual. Steel mills show a climbing average in their output figures, largely because of orders from automobile manufacturers. February production is expected to surpass that of any 1933 month. Retail sales of cars have been slow. The weather has been given as one reason, and the delay in getting cars in the hands of dealers as another. It seems reasonable to suppose, however, that sales will keep better pace with production when the weather is more favorable for driving.

To sum up, the imminence of restriction is bolstering prices; while overproduction is making drastic action imperative. Production is increasing, but so is consumption; and if production can be controlled, consumption would have a better chance to eat up the burdensome stocks on hand.

Week ended February 3. After advancing to the highest prices in 4 years, the rubber market eased off and ended with gains of only 3 to 14 points. Monday was the big day. Reports from Amsterdam stated a restriction agreement had been reached to go into effect by April 1. Gains for the day were 51 to 55 points, with prices ranging between 10.44 and 11.52¢.

A Commodity Exchange bulletin stated: "Reuter learned from well-informed quarters that the 'quota basis' of countries involved has been settled and that the operation date will be April 1. The impression gained here is that the main obstacles to the negotiation angle have been removed but the working committee is now faced with a technical solution to the problem of native Dutch East India rubber."

Another London cable said substantially the same thing, but added: "The *Financial News* states that the 'quota' for the first year covering Malaya, Ceylon and the Dutch East Indies will be a half million tons. The 'quotas' have been allotted on the basis of a capacity production of a million tons annually."

The March position closed at 10.01¢, compared with 9.88¢ the previous week; May 10.32 against 10.18; July 10.59 against 10.45; September 10.82 against 10.68; October 10.92 against 10.80; and December 11.12 against 11.00.

Dutch East Indies shipments for December were 35,041 tons, compared with 20,670 a year ago. For 1933 exports were 319,417 tons against 230,107 in 1932 and 284,199 in 1931. Combined exports of Malaya, Dutch East Indies, and Ceylon for 1933 were 788,901 tons, against 665,309 in 1932, and 740,006 tons in 1931.

The devaluation of the dollar at 59.06¢ helped rubber prices since sterling firmed after the announcement.

Good news came from Akron. The large tire manufacturers announced an unusual midwinter demand, and reports stated that wages of 40,000 workers were increased. Several companies adopted a 6-day week. One company reported sales increased 62%; another official estimated an increase for the whole industry of 8% in 1934 over 1933. The dollar volume of automobile financing increased 30.6% in 1933 over the previous year. For the first 4 months, financing was behind 1932, but from May to December every month was better than the same one the year before. Then General Motors reported a net profit for 1933 of $83,214,000 against $165,000 in 1932. Automobiles sold increased 54% over 1932.

In the Outside Market business was considerable, coming from all sources, large and small manufacturers, with Akron doing a heavy volume in response to the demand for tires.

Nearby ribbed smoked sheets closed at 10¢, against 10 1/8 the week before; April-June 10 3/8 unchanged; July-September 10 11/16 against 10 3/4; and October-December 11 1/16 unchanged.

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	January, 1934								
	22	23	24	25	26	27	29	30	31
Ribbed Smoked Sheet...	9 3/8	9 3/8	9 5/8	10 1/16	10 1/8	10 1/16	10 3/8	9 7/8	10 1/8
No. 1 Thin Latex Crepe..	10 7/8	10 7/8	11 1/8	11 1/2	11 1/2	11 1/2	11 3/4	11 1/4	11 5/8
No. 1 Thick Latex Crepe.	10 5/8	10 5/8	10 7/8	11 1/4	11 1/4	11 1/4	11 1/2	11	11 3/8
No. 1 Brown Crepe.....	7 1/8	7 1/8	7 1/2	7 3/4	7 7/8	7 3/4	8 1/4	7 7/8	8
No. 2 Brown Crepe.....	7	7	7 3/8	7 5/8	7 3/4	7 5/8	8 1/8	7 3/4	7 7/8
No. 2 Amber...........	7 1/8	7 1/8	7 1/2	7 3/4	7 7/8	7 3/4	8 1/4	7 7/8	8
No. 3 Amber...........	7	7	7 3/8	7 5/8	7 3/4	7 5/8	8 1/8	7 3/4	7 7/8
No. 4 Amber...........	6 1/2	6 1/2	6 7/8	7 1/8	7 1/4	7 1/8	7 5/8	7 1/4	7 3/8
Rolled Brown..........	5 3/8	5 3/8	5 1/2	5 3/4	5 7/8	5 3/4	6 1/4	6	6 1/4

	February, 1934														
	1	2	3	5	6	7	8	9	10	12*	13	14	15	16	17
Ribbed Smoked Sheet...	9 15/16	9 13/16	9 15/16	10 1/8	10 3/4	10 3/8	10 1/4	10 5/8	10 3/4	..	10 3/8	10 3/8	10 5/8	10 3/4	10 5/8
No. 1 Thin Latex Crepe..	11 1/2	11 1/4	11 3/8	11 5/8	12 1/4	12	11 7/8	12 1/8	12 1/4	..	11 7/8	11 7/8	12 1/8	12 1/4	12 1/8
No. 1 Thick Latex Crepe.	11 1/4	11	11 1/8	11 3/8	12	11 3/4	11 5/8	11 7/8	12	..	11 5/8	11 5/8	12	12 1/8	12
No. 1 Brown Crepe.....	7 7/8	7 3/4	7 7/8	8 1/8	8 3/4	8 3/8	8 3/8	8 5/8	8 3/4	..	8 1/2	8 1/2	8 5/8	8 3/4	8 5/8
No. 2 Brown Crepe.....	7 3/4	7 5/8	7 3/4	8	8 5/8	8 1/4	8 1/4	8 1/2	8 5/8	..	8 3/8	8 3/8	8 1/2	8 5/8	8 1/2
No. 2 Amber...........	7 7/8	7 3/4	7 7/8	8 1/8	8 3/4	8 3/8	8 3/8	8 5/8	8 3/4	..	8 1/2	8 1/2	8 5/8	8 3/4	8 5/8
No. 3 Amber...........	7 3/4	7 5/8	7 3/4	8	8 5/8	8 1/4	8 1/4	8 1/2	8 5/8	..	8 3/8	8 3/8	8 1/2	8 5/8	8 1/2
No. 4 Amber...........	7 1/4	7 1/8	7 1/4	7 1/2	8 1/8	7 3/4	7 3/4	8	8 1/8	..	7 7/8	7 7/8	8	8 1/8	8
Rolled Brown..........	6 1/8	6	6 1/8	6 3/8	6 3/4	6 3/8	6 1/2	6 3/4	6 7/8	..	6 5/8	6 5/8	6 3/4	6 7/8	6 3/4

*Holiday.

Week ended February 10. Despite cables stating the restriction agreement would be signed next Friday, the week-end produced no actual change in the situation. No definite date can yet be set for final consummation of the agreements. Meetings still continue. Evidently the native problem is only one of the obstructions, and the output of European planters is another point to hurdle. On the whole, however, the market gained ground substantially. Exchange rates caused minor setbacks, but the opinion of traders that agreement is on the way bolstered prices.

Gains for the week were from 68 to 73 points. March closed at 10.72¢, compared with 10.01¢ the week before; May 11.00 against 10.32; July 11.30 against 10.59; September 11.52 against 10.82; October 11.63 against 10.92; and December 11.85 against 11.12.

Malayan statistics showed January shipments of 55,276 tons, against 57,579 tons in December, and 46,600 in January, 1933.

Automobile production last week was 56,693 units, according to *Cram's Automotive Reports*, against 44,796 in the previous week and 33,292 a year ago. Dealers still lack new car models; consequently retail sales are slow in picking up.

The automobile and the tire industries furnished much optimistic material last week. Ford expects February production to be the best in 4 years. He also announced a 10% increase in the wages of 20,000 men. Twice as many men work in his plants now as did a year ago.

The Iron Age reports the present upturn in business by the steel mills is largely due to demands by automobile manufacturers.

"Business," says *The Iron Age*, "is still unevenly distributed, but this is due to the current preponderance of orders for light rolled products and has nothing to do with the disgruntled attitude of certain motor car builders toward the Steel Code. It is now clear that the real reason the automobile industry has been spreading its steel orders among a larger number of mills is that it wishes to guard against delays in delivery."

Outside Market business was very good last week, with prices higher. February-March ribbed smoked sheets were 10⅞¢, compared with 10¢ last week; April-June 11 against 10⅜; July-September 11⅜ against 10 11/16; and October-December 11¾ against 11 1/16.

Week ended February 17. Cables denying an agreement had been reached on restriction were received in the first session, and they served to deflate the market by 42 to 47 points. Later reports discounted this news, and the market recovered to close the week with gains of 8 to 13 points. Dr. Colijn made a sudden visit to London, but the purpose of his flying trip was carefully guarded. Rumors had it that he intended to discuss currency and defense problems. He called to see Walter Runciman, president of the Board of Trade in London, which led observers to believe that tariff matters were discussed.

Secrecy was again observed at a meeting on Friday on restriction called in Amsterdam by the International Association of Rubber Culture of the Dutch East Indies. Delegates had to take an oath, it was reported, not to reveal what happened, even to their business associates. The long-drawn-out negotiations are weakening the faith of traders, and they point out with concern that both native and estate production is being forced to unusual figures in anticipation of an eventual agreement.

At the close, March sold at 10.64¢, against 10.72¢ the week before; May 10.89 against 11.00; July 11.18 against 11.30; October 11.52 against 11.63; and December 11.72 against 11.85.

January consumption was much greater than expected, being 40,413 tons, compared with 29,087 in December. But January imports were 46,204 tons, thus increasing the stocks on hand to 368,660 tons.

The expected tire price increase by tire manufacturers to keep prices in line with the 3% advance announced by Goodyear probably will not materialize at present.

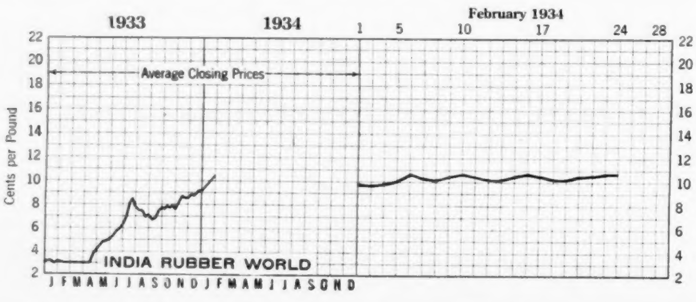
James D. Tew, president of The B. F. Goodrich Co., said, "An increase far in excess of 3% is amply justified by both increased labor and material costs, but it is our opinion that competitive conditions will be worse than better for the manufacturer and the dealer if we increase prices and the mass distributers make no change. The B. F. Goodrich Co. is making no change in tire prices at this time as it does not believe an advance can be maintained until special-brand distributers raise prices."

Business on the Outside Market continues good. Buyers from Akron were bidding all week, and the smaller manufacturers did their share. The advance in prices in the last few weeks has led manufacturers to believe it might be best to cover requirements now before an announcement on restriction gives quotations another big boost.

Nearby ribbed smoked sheets closed at 10 11/16¢, compared with 10⅞ the week before; April-June 10 13/16 against 11.00; July-September 11 5/16 against 11⅜; and October-December 11⅝ against 11¾.

Week ended February 24. On Monday rubber prices eased off 9 to 16 points in early trading and closed 13 to 24 points lower, on a volume of

(*Continued on page* 70)



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

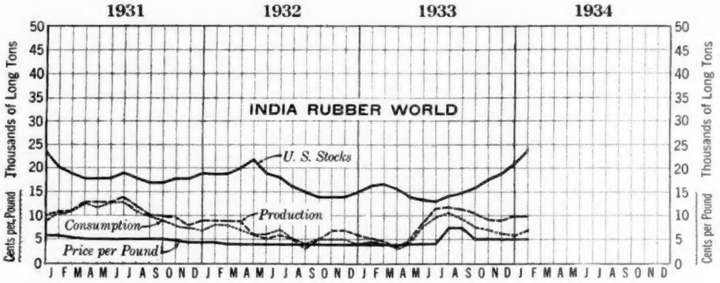
New York Quotations

New York outside market rubber quotations in cents per pound

	Feb. 25, 1933	Jan. 26, 1934	Feb. 23, 1934
Plantations			
Rubber latex...*gal.*	.42	50	50
Sheet			
Ribbed, smoked, spot	2 15/16	9 11/16 / 9¾	10⅝
Feb.-Mar.	2 15/16	... ...	10⅝
Apr.-June	3 /3 1/16	10 1/16/10⅛	10⅞
July-Sept.	3⅛/3¼	10 5/16/10⅜	11¼
Crepe			
No. 1 thin latex, spot	3¾/3 13/16	11 3/16/11¼	12¼
Feb.-Mar.	3¾/3 13/16	... ...	12⅝
Apr.-June	3⅞/3 15/16	11½/11 9/16	12¾
July-Sept.	4 /4⅛	11¾/11 13/16	13
No. 3 Amber, spot	2 7/16	7⅜/ 7 7/16	8⅝
No. 1 Brown	2½	7½/ 7 9/16	8½
Brown, rolled	2 3/16	5½/ 5 9/16	6¾
Paras			
Upriver fine	5½	9	10
Upriver fine	*9⅛	*11¾	*13¼
Upriver coarse	...	6	6
Upriver coarse	*4¾	*10½	*10½
Islands, fine	...	8½	....
Islands, fine	*9	*11¼	*12¾
Acre, Bolivian fine	5⅞	9¼	10¼
Acre, Bolivian fine	*9¼	*12	*13½
Beni, Bolivian	6	9¼	10
Madeira fine	5⅝	9	10¼
Caucho			
Upper ball	...	6	6
Upper ball	*4¾	*10¼	*10½
Lower ball	...	...	5
Pontianak			
Bandjermasin	4	6	...
Pressed block	6½	11	...
Sarawak	4	6	...
Manicobas			
Manicoba, 30% guar.	†2¼	†5	6
Mangabiera, thin sheet		†5	6
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	...	12	12
Black Kassai	...	10	10
Manihot cuttings	...	...	...
Prime Niger flake	...	18	18
Gutta Percha			
Gutta Siak	6½	10½	10½
Gutta Soh	11	15	15
Red Macassar	1.75	1.50	1.50
Balata			
Block, Ciudad Bolivar	16½	40	40
Manaos block	17	32	32
Surinam sheets	26	42	42
Amber	28	47	47

*Washed and dried crepe. Shipments from Brazil. †Nominal.

RECLAIMED RUBBER



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933					
January	5,301	4,811	21.0	16,262	130
February	4,578	4,363	20.2	16,570	178
March	3,847	3,454	19.1	15,496	353
April	4,617	4,407	16.8	14,370	165
May	8,366	7,770	17.4	13,734	319
June	10,591	9,674	18.8	13,231	223
July	12,049	10,327	20.6	14,108	507
August	11,708	9,446	21.0	15,037	353
September	10,435	7,862	22.0	15,869	367
October	9,466	7,212	22.6	17,748	310
November	9,063	6,335	21.7	19,170	272
December	9,953	5,951	20.5	20,746	406
1934					
January	9,828	7,000	17.3	24,303	...

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

CONSUMERS' demand for reclaim is broadening consistently owing to 2 circumstances: namely, the general business improvement activating the increase of tire and mechanical goods production, especially garden and other hose; and the action of the crude rubber market caused by the discussion of the restriction of crude rubber production.

Prices are firm and nominal. Quotations have advanced on several grades. Thus black super-reclaim is now 7¾ to 8¢ as compared with 7 to 7½; red super-reclaim at 6¾ to 7¢ is up ¼¢ from last month. Auto tire grades are unchanged except that the white quality is quoted at 7½ to 7¾¢, up ½¢ from a month ago. No. 2 tubes are advanced ¾¢, being reported now at 7 to 7¼¢. All other grades are quoted unchanged from a month ago.

New York Quotations

February 24, 1934

	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	7¾/8
red	1.20	6¾/7
Auto Tire		
Black	1.21	4¾/5
Black selected tires	1.18	5 /5¼
Dark gray	1.35	5¾/6
White	1.40	7½/7¾
Shoe		
Unwashed	1.60	6½/6¾
Washed	1.50	8 /9
Tube		
No. 1	1.00	11 /
No. 2	1.10	7 /7¼
Truck Tire		
Truck tire, heavy gravity	1.55	5¼/5½
Truck tire, light gravity	1.40	5¾/6
Miscellaneous		
Mechanical blends	1.60	4 /4¼

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for January, 1934:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

To	January, 1934 Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	9,888	272
United States	27,549	445
Continent of Europe	11,335	316
British possessions	678	39
Japan	3,967	20
Other countries	763	4
Totals	54,180	1,096

Rubber Imports: Actual, by Land and Sea

From	January, 1934 Dry Rubber Tons	Wet Rubber Tons
Sumatra	938	9,366
Dutch Borneo	632	6,063
Java and other Dutch islands	289	91
Sarawak	1,160	37
British Borneo	420	44
Burma	421	40
Siam	587	703
French Indo-China	215	96
Other countries	70	12
Totals	4,732	16,452

RUBBER SCRAP

DISTINCT improvement is noted in the general demand for rubber scrap and for tires and tubes in particular. This is reflected in the somewhat sharp advance of price asked for certain of these scrap grades.

Export trade in tire and tube scrap was reported active one month ago, but during February, however, no further improvement was noted in this field.

BOOTS AND SHOES. Trade in shoe grades was active, with prices at the same levels as in January.

INNER TUBES. The demand for all grades of inner tubes holds good, with corresponding increase in prices for compounded and mixed tube grades. No. 2 compounded tubes advanced ⅝¢ over the price of one month ago and are now quoted at 3½ to 3⅝¢. Similarly mixed tubes have advanced the same amount and are quoted at 3⅛ to 3¼¢.

TIRES. The supply is well maintained, and demand shows considerable improvement although not so much as in the case of tubes. Mixed auto tires with beads advanced $1 per ton and are now at $11.50 to $12 a ton. Mixed beadless auto tires advanced from 50¢ to 75¢ a ton, their present quotation being $17 to $17.50 per ton. Black auto peelings have moved up $2 to $20 to $21 a ton.

SOLID TIRES. Clean mixed truck tires are quoted at $37 to $38 a ton, an increase of $3 a ton over a month ago. Light gravity grade is quoted unchanged.

MECHANICALS. All grades of mechanical scrap are unchanged in price.

HARD RUBBER. No. 1 hard rubber is quoted unchanged. Supplies are quite scarce.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

February 24, 1934

		Prices
Boots and Shoes		
Boots and shoes, black	*lb.*	$0.01¼/$0.01½
Colored	*lb.*	.01 / .01¼
Untrimmed arctics	*lb.*	.01 / .01¼
Inner Tubes		
No. 1, floating	*lb.*	.05¼/ .05¾
No. 2, compound	*lb.*	.03½/ .03⅝
Red	*lb.*	.02¾/ .02⅞
Mixed tubes	*lb.*	.03⅛/ .03¼
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	*ton*	11.50 /12.00
Beadless	*ton*	17.00 /17.50
Auto tire carcass	*ton*	11.00 /12.00
Black auto peelings	*ton*	20.00 /21.00
Solid		
Clean mixed truck	*ton*	37.00 /38.00
Light gravity	*ton*	40.00 /42.00
Mechanicals		
Mixed black scrap	*lb.*	.01 / .01¼
Hose, air brake	*ton*	13.00 /14.00
Garden, rubber covered	*ton*	10.00 /11.00
Steam and water, soft	*ton*	10.00 /11.00
No. 1 red	*lb.*	.01½/ .01¾
No. 2 red	*lb.*	.01 / .01¼
White druggists' sundries	*lb.*	.01¾/ .01⅞
Mechanical	*lb.*	.01¼/ .01½
Hard Rubber		
No. 1 hard rubber	*lb.*	.08¾/ .09


MICRONEX
200 TONS OF SMOKE A DAY

COMPOUNDING INGREDIENTS

RUBBER chemicals as accelerators, age resisters, etc., and compounding ingredients of the less active sorts all are in fairly good consuming demand in quantities supplied from stock. Orders are not running heavily to carload lots. The output of tires is fairly large; while the seasonal production of garden hose is in full swing. Improvement is noted in insulated wire production, footwear, heels, proofing, and automobile topping to meet seasonal improvement of consumption.

CARBON BLACK. The demand was moderate the past month. On the 15th the prices for less than carload lots was advanced ½¢ per pound. These advances were inclusive at 7¢ per pound for material in bags, 7¾¢ for material in cartons, and 8¼¢ for material in cases. These prices are for stock delivered at buyers' plants.

LITHARGE. This material is in routine demand. The price is 6¾¢ per pound unchanged since last October.

LITHOPONE. Consuming demand is fair for lithopone. Shipments of 5 tons are again being made at the carload lot rates.

RUBBER SOLVENTS. Early in February tank-car prices were advanced on both heavy and light grades to 6⅞¢ per gallon by Group 3 refineries. Demand by tire manufacturers was active during February for light and heavy grades.

STEARIC ACID. Demand has been conservative at unchanged prices.

TITANIUM PIGMENTS. Demand by the rubber industry is reported good. Prices are firm and unchanged.

ZINC OXIDE. Imported White Seal and French zinc oxide advanced quotations ¾¢ per pound the last of January. Domestic oxides are in fair demand, and prices are unchanged.

New York Quotations

February 24, 1934

Prices Not Reported Will Be Supplied on Application

Abrasives			
Pumicestone, pwd.	*lb.*	$0.02½	/$0.04
Rottenstone, domestic	*ton*	23.50	/28.00
Accelerators, Inorganic			
Lime, hydrated	*ton*	20.00	
Litharge (commercial)	*lb.*	.06¾	
Magnesia, calcined, heavy	*lb.*	.04	/ .04½
carbonate	*lb.*	.06	/ .06¼
Accelerators, Organic			
A-1 (Thiocarbanilid)	*lb.*	.21	/ .25
A-5-10	*lb.*	.33	/ .36
A-7	*lb.*	.53	/ .65
A-11	*lb.*	.60	/ .75
A-16	*lb.*	.55	/ .65
A-19	*lb.*	.56	/ .75
A-32	*lb.*	.70	/ .80
Accelerator 49	*lb.*	.40	/ .52
Aldehyde ammonia	*lb.*	.65	/ .70
Altax	*lb.*		
Anhydroformaldehyde-para-toluidine	*lb.*		
Barak	*lb.*		
Butene	*lb.*		
Captax	*lb.*		
Crylene	*lb.*		
paste	*lb.*		
DBA	*lb.*		
Di-esterex N.	*lb.*		
DOTG	*lb.*	.44	/ .57
DPG	*lb.*	.33	/ .47
du Pont 808	*lb.*		
833	*lb.*		
Ethylidine aniline	*lb.*		
Formaldehyde aniline	*lb.*		
Guantal	*lb.*	.42	/ .51
Heptene	*lb.*		
base	*lb.*		
Hexamethylenetetramine	*lb.*	.37	
Lead oleate, No. 999	*lb.*	.10½	
Witco	*lb.*	.10	
Lithex	*lb.*		
Monex	*lb.*		
Novex	*lb.*		
Pipsol X	*lb.*	3.55	/ 4.00
Plastone	*lb.*		
R-2	*lb.*	1.55	/ 1.90
base	*lb.*	4.55	/ 5.00
R & H 40	*lb.*		
50-D	*lb.*		
Safex	*lb.*		
Super-sulphur No. 1	*lb.*		
No. 2	*lb.*		
Tetrone A	*lb.*		
Thio	*lb.*		
Thiocarbanilid	*lb.*	.20	
Thionex	*lb.*		
Trimene	*lb.*		
base	*lb.*		
Triphenyl guanidine	*lb.*	.58	/ .60
Tuads	*lb.*		
Ureka	*lb.*	.62	/ 1.00
C	*lb.*	.58	/ .69
Vulcanex	*lb.*		
Vulcanol	*lb.*		
Vulcone	*lb*		
ZBX	*lb.*		
Z-88-P	*lb.*	.48	/ .60
Zimate	*lb.*		
Acids			
Acetic 28% (bbls.)	*100 lbs.*	2.91	/ 3.16
glacial (carboys)	*100 lbs.*	14.00	
Sulphuric, 66°	*ton*	15.50	
Age Resisters			
Age-Rite Gel	*lb.*		

powder	*lb.*		
resin	*lb.*		
white	*lb.*		
Aibasan	*lb.*		
Antox	*lb.*		
BLE	*lb.*		
Flectol A	*lb.*	$0.54	/$0.60
B	*lb.*	.54	/ .60
H	*lb.*		
Hiflex B	*lb.*		
Neozone	*lb.*		
Oxynone	*lb.*	.66	/ .90
Parazone	*lb.*		
Permalux	*lb.*		
Resistox	*lb.*	.52	/ .65
VGB	*lb.*		
Zalba	*lb.*		
Antiscorch Material			
UTB	*lb.*		
Antisun Materials			
Heliozone	*lb.*		
Sunproof	*lb.*		
Binders, Fibrous			
Cotton flock, dark	*lb.*	.09	/ .11½
dyed	*lb.*	.50	/ .80
white	*lb.*	.11½	/ .17½
Rayon flock, colored	*lb.*	1.60	/ 1.75
white	*lb.*	1.40	
Brake Lining Saturants			
B. R. C. No. 553	*lb.*		
B. R. T. No. 3	*lb.*		
Colors			
BLACK			
Bone, powdered	*lb.*	.05½	/ .15
Drop	*lb.*	.05½	/ .17
Lampblack (commercial)	*lb.*	.08	/ .12
BLUE			
Brilliant	*lb.*		
Prussian	*lb.*	.35½	
Toners	*lb.*	.80	/ 3.50
Ultramarine	*lb.*	.07	/ .10
BROWN			
Mapico	*lb.*	.13	
Sienna, Italian, raw, pwd.	*lb.*	.04¾	/ .12½
GREEN			
Brilliant	*lb.*		
Chrome, light	*lb.*	.23	/ .25½
medium	*lb.*	.26	/ .27½
oxide	*lb.*	.22	/ .23
Dark	*lb.*		
Guignet's (bbls.) f.o.b. Easton	*lb.*	.70	
Light	*lb.*		
Toners	*lb.*	.85	/ 3.50
ORANGE			
Lake	*lb.*		
Toners	*lb.*	.40	/ 1.60
ORCHID			
Toners	*lb.*	1.50	/ 2.00
PINK			
Toners	*lb.*	1.50	/ 4.00
PURPLE			
Permanent	*lb.*		
Toners	*lb.*	.60	/ 2.00
RED			
Antimony			
Crimson, R. M. P. No. 3	*lb.*	.46	
Sulphur free	*lb.*	.48	
7-A	*lb.*	.32	
Z-2	*lb.*	.20	

Chinese	*lb.*		
Crimson	*lb.*		
Iron Oxides			
Rub-er-red (bbls.) f.o.b. Easton	*lb.*	$0.09¼	
Mapico	*lb.*	.08¾	
Medium	*lb.*		
Scarlet	*lb.*		
Toners	*lb.*	.80	/$2.00
WHITE			
Lithopone (bags)	*lb.*	.04½	/ .04¾
Albalith	*lb.*	.04½	/ .04¾
Cryptone No. 19	*lb.*	.06	/ .06¼
CB No. 21	*lb.*	.06	/ .06¼
Rayox	*lb.*		
Titanox—A	*lb.*	.17	/ .18¾
B	*lb.*	.06	/ .06½
C	*lb.*	.06	/ .06½
Zinc Oxide			
Black label (lead free)	*lb.*	.05¾	
Ceramatone	*lb.*	.05¾	/ .06
F. P. Florence, green seal	*lb.*	.09⅜	/ .09⅝
red seal	*lb.*	.08⅜	/ .08⅝
white seal (bbls.)	*lb.*	.10⅝	
Green label (lead free)	*lb.*	.05¾	
seal, Anaconda	*lb.*	.09⅜	/ .09⅝
Horsehead (lead free) brand			
Selected	*lb.*	.05¾	/ .06
Special	*lb.*	.05¾	/ .06
XX	*lb.*	.05¾	/ .06
red	*lb.*	.05¾	/ .06
Kadox, black label	*lb.*	.09⅜	/ .09⅝
blue label	*lb.*	.08⅜	/ .08⅝
red label	*lb.*	.07	/ .07¼
Lead free (all grades) Anaconda	*lb.*	.05¾	/ .06
Leaded, 5%, Anaconda	*lb.*	.05½	/ .05¾
35%, Anaconda	*lb.*	.05	/ .05¼
Lehigh (leaded)	*lb.*	.05	/ .05¼
Red label (lead free)	*lb.*	.05¾	
seal, Anaconda	*lb.*	.08⅜	/ .08⅝
Standard (leaded)	*lb.*	.05½	/ .05¾
U. S. P. (bbls.)	*lb.*	.12½	/ .12¾
White seal, Anaconda	*lb.*	.10⅝	
XX zinc sulphide	*lb.*	.11	/ .11¾
YELLOW			
Chrome	*lb.*	.16	
Lemon	*lb.*		
Mapico	*lb.*	.09½	
Ochre, domestic	*lb.*	.01⅜	/ .02¼
Toners	*lb.*	2.50	
Dispersing Agents			
B. R. V.	*lb.*		
Bardex	*lb.*		
Bardol	*lb.*		
Factice—See Rubber Substitutes			
Fillers, Inert			
Asbestine	*ton*	15.00	
Barytes (f.o.b. St. Louis)	*ton*	23.00	
off color	*ton*	20.00	/25.00
white	*ton*	32.50	/35.00
Blanc fixe, dry precip.	*ton*	70.00	/75.00
pulp	*ton*	42.50	/45.00
Infusorial earth	*lb.*	.03	
Kalite No. 1	*ton*		
No. 3	*ton*		
Suprex, white, extra light	*ton*	65.00	
heavy	*ton*	45.00	
Whiting			
Chalk, precipitated	*lb.*		
Domestic	*ton*		
Hakuenka	*lb.*		

Paris white, English cliffstone	100 *lbs.*	
Sussex	*ton*	
Witco	*ton*	$20.00
Wood flour (f.o.b. New Hampshire)	*ton*	19.00 /$50.00

Fillers for Pliability

Flex	*lb.*	
Fumonex	*lb.*	.03 / .06
P-33	*lb.*	
Thermax	*lb.*	
Velvetex	*lb.*	.03 / .05

Finishes

IVCO lacquer, clear	*gal.*	2.60 / 2.90
colors	*gal.*	2.70 / 3.35
Mica, amber	*lb.*	.03½/ .05
Rubber lacquer No. 106	*gal.*	3.00
Starch, corn, pwd.	100 *lbs.*	2.81 / 3.01
potato	*lb.*	.05¼/ .06
Talc, dusting	*ton*	20.00
Pyrax	*ton*	

Latex Compounding Ingredients

Accelerator 552	*lb.*	
Aquarex	*lb.*	
Aresco	*lb.*	.28 / .40
Catalpo	*ton*	
Colloidal color pastes	*lb.*	
sulphur	*lb.*	
zinc oxide	*lb.*	
Disinfectants	*lb.*	
Dispersaid	*lb.*	1.50
Dispersed Antox	*lb.*	
factice compound	*lb.*	.26
Emo, brown	*lb.*	.13
white	*lb.*	.13
Emulsified Heliozone	*lb.*	
Igepon A	*lb.*	
Nekal BX (dry)	*lb.*	
Neozone L	*lb.*	
Palmol	*lb.*	.09
Tepidone	*lb.*	
Vulcan colors	*lb.*	

Mineral Rubber

B. R. C. No. 20	*ton*	
Genasco (fact'y)	*ton*	30.00 /32.00
Gilsonite (fact'y)	*ton*	37.14 /39.65
Granulated M. R.	*ton*	
Hydrocarbon, granulated	*ton*	40.00 /42.00
hard	*ton*	
soft	*ton*	
Parmr Grade 1	*ton*	23.00 /28.00
Grade 2	*ton*	23.00 /28.00
265°	*ton*	

Mold Lubricants

Rusco mold paste	*lb.*	.12 / .30
Sericite	*ton*	65.00
Soapbark (cut)	*lb.*	.07½/ .08
Soapstone	*ton*	20.00

Oils

Castor, blown	*lb.*	.12¼/ .12¾
Poppyseed	*gal.*	1.50 / 1.60
Red, distilled (bbls.)	*lb.*	.07 / .07⅝

Protective Colloid

Casein, domestic	*lb.*	.12 / .12½

Reclaiming Oil

S. R. O.	*lb.*	

Reenforcers

Carbon Black		
Aerfloted arrow black	*lb.*	.0535/ .08¼
Aerfloted arrow specification black	*lb.*	.05½/ .08½
Century (delivered)	*lb.*	.0445/ .0535
"Certified" Cabot	*lb.*	
Spheron	*lb.*	
Disperso (delivered)	*lb.*	.0445/ .0535
Dixie, c.l., f.o.b. New Orleans, La.; Galveston or Houston, Tex.	*lb.*	$0.0445
local stock, delivered	*lb.*	.07 /$0.08¼
Gastex	*lb.*	.03 / .07
Kosmos, c.l., f.o.b. New Orleans, La.; Galveston or Houston, Tex	*lb.*	.0445
local stock, delivered	*lb.*	.07 / .08¼
Micronex	*lb.*	.0505/ .0535
Ordinary (compressed or uncompressed)	*lb.*	
Clays		
Blue Ridge, dark	*ton*	
China	*ton*	9.00
Dixie	*ton*	
Langford	*ton*	
McNamee	*ton*	
Par	*ton*	
Perfection	*ton*	7.50 / 9.00
Standard	*ton*	
Suprex No. 1	*ton*	10.00 /24.00
No. 2, dark	*ton*	7.50
Glue, high grade	*lb.*	.23 / .28

Reodorants

Amora A	*lb.*	
B	*lb.*	
C	*lb.*	
D	*lb.*	
Para-Dors	*lb.*	
Rodo No. 0	*lb.*	
No. 10	*lb.*	

Rubber Substitutes or Factice

Amberex	*lb.*	.13¾
Black	*lb.*	.06 / .08
Brown	*lb.*	.07 / .11
White	*lb.*	.07½/ .13

Softeners

B. R. C. No. 555	*lb.*	
B. R. T. No. 7	*lb.*	
Burgundy pitch	*lb.*	.05
Cumar	*lb.*	.07 / .09¾
Cycline oil	*gal.*	.15 / .28
Fluxol	*ton*	
Hardwood pitch, c.l.	*ton*	24.00 /25.00
Palm oil (Witco)	*lb.*	.08
Petrolatum, light amber	*lb.*	.02⅞/ .03⅛
Pine tar	*gal.*	.32
Plastogen	*lb.*	
Rosin oil, compounded	*gal.*	.35
Rubtack	*lb.*	.10
Tackol	*lb.*	.085 / .18
Tonox	*lb.*	
Witco #20	*gal.*	.15

Solvents

Benzol 90% (drums)	*gal.*	.25½
Bondogen	*gal.*	
Carbon bisulphide (drums)	*lb.*	.05½/ .12
tetrachloride	*lb.*	.05¼/ .06
Turpentine, steam distilled	*gal.*	.60 / .61

Stabilizers for Cure

Laurex, ton lots	*lb.*	
Stearex B	*lb.*	.08½/ .10
flake	*lb.*	.08 / .09
Stearic acid, dbl. pres'd.	*lb.*	.10 / .12
Zinc stearate	*lb.*	.19

Tackifier

B. R. H. No. 2	*lb.*	

Tear Resister

Carbonex	*lb.*	

Vulcanizing Ingredients

Sulphur		
Chloride, drums	*lb.*	.03½/ .04
Flowers, extrafine refined, U.S.P.	100 *lbs.*	
Rubber	100 *lbs.*	1.95 / 2.80
Telloy	*lb.*	
Vandex	*lb.*	

(See also Colors—Antimony)

Tire Production Statistics

	Pneumatic Casings—All Types		
	Inventory	Production	Total Shipments
1932	6,115,487	32,067,732	32,200,820
1933			
Jan.	**5,789,476**	1,806,277	2,077,268
Feb.	**5,901,557**	1,871,498	**1,833,970**
Mar.	5,831,981	1,630,319	1,673,502
Apr.	**5,418,979**	**2,498,795**	**2,923,154**
May	**5,408,132**	**4,151,433**	**4,144,138**
June	5,291,952	4,879,939	5,044,363
July	**5,475,205**	**4,570,901**	**4,397,753**
Aug.	5,655,659	**3,994,887**	3,765,668
Sept.	6,075,605	3,199,391	2,802,692
Oct.	6,769,388	2,742,926	2,029,577
Nov.	7,397,250	2,431,509	1,757,988
Dec.	7,110,456	2,465,509	2,824,897
	Solid and Cushion Tires		
1932	**23,830**	97,089	**108,581**
1933			
Jan.	**21,956**	5,536	6,868
Feb.	......	6,829	7,920
Mar.	......	6,795	6,622
Apr.	......	7,149	7,766
May	......	9,229	9,256
June	......	14,843	14,888
July	......	14,956	13,606
Aug.	......	16,375	13,450
Sept.	......	14,522	13,767
Oct.	......	11,989	10,959
Nov.	......	11,379	9,304
Dec.	......	11,385	12,584
	Inner Tubes—All Types		
1932	5,399,551	29,513,246	30,328,536
1933			
Jan.	**4,957,298**	1,674,557	2,028,100
Feb.	**5,085,321**	**1,778,818**	**1,681,853**
Mar.	**5,095,340**	1,506,141	1,521,736
Apr.	**4,951,399**	**2,282,298**	**2,440,555**
May	**5,105,389**	**3,760,121**	**3,570,700**
June	4,877,686	4,358,325	4,622,473
July	5,152,187	4,482,074	4,168,919
Aug.	**5,302,736**	**3,933,134**	**3,749,898**
Sept.	**5,606,752**	3,069,600	2,777,935
Oct.	**6,264,977**	**2,804,511**	**2,140,520**
Nov.	6,900,205	2,290,445	1,682,132
Dec.	6,251,941	2,104,665	2,727,651

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1932	128,981,222	416,577,533	15,703,800,000
1933			
Jan.	**7,899,233**	**27,368,276**	**1,110,564,000**
Feb.	**7,263,337**	**25,123,700**	**979,608,000**
Mar.	**6,364,276**	**21,508,416**	**1,186,122,000**
Apr.	10,460,327	35,169,724	1,267,392,000
May	16,778,354	58,202,264	1,427,958,000
June	19,552,783	67,860,087	1,583,820,000
July	**18,709,458**	**64,936,169**	**1,447,236,000**
Aug.	**16,820,552**	**57,022,618**	**1,571,892,000**
Sept.	**13,591,881**	**45,160,710**	1,440,726,000
Oct.	11,115,727	40,283,541	1,384,866,000
Nov.	10,447,079	35,194,207	1,271,004,000
Dec.	9,986,286	34,653,711	1,209,558,000

Rubber Manufacturers Association, Inc., figures representing approximately 80% of the industry, with the exception of gasoline consumption.

Plantation Rubber Crop Returns by Months

1933	Borneo (26 Companies) Long Tons	Index	Ceylon (102 Companies) Long Tons	Index	India and Burma (21 Companies) Long Tons	Index	Malaya (338 Companies) Long Tons	Index	Netherlands East Indies—Java (60 Companies) Long Tons	Index	Netherlands East Indies—Sumatra (60 Companies) Long Tons	Index	Miscellaneous (8 Companies) Long Tons	Index	Total (615 Companies) Long Tons	Index
January	360	73.6	1,124	55.1	120	21.4	12,467	100.3	2,561	97.5	3,837	95.2	124	68.5	20,593	92.1
February	323	66.1	905	44.3	46	8.2	11,630	93.5	2,703	102.9	4,207	104.3	54	29.8	19,868	88.8
March	319	65.2	992	48.6	126	22.4	10,508	84.5	2,756	105.0	4,171	103.4	93	51.4	18,965	84.8
April	304	62.2	1,242	60.9	139	24.7	10,532	84.7	2,845	108.3	3,851	95.5	121	66.9	19,034	85.1
May	333	68.1	880	43.1	117	20.8	11,879	95.5	2,995	114.1	4,158	103.1	134	74.0	20,496	91.7
June	334	68.3	995	48.8	31	5.5	12,411	99.8	2,965	112.9	4,235	105.0	140	77.3	21,111	94.4
July	354	72.4	1,258	61.6	29	5.2	12,515	100.7	2,919	111.2	4,556	113.0	133	73.5	21,764	97.3
August	369	75.5	1,397	68.4	40	7.1	12,842	103.3	2,449	93.3	4,435	110.0	127	70.2	21,659	96.9
September	373	76.3	1,488	72.9	197	35.1	12,252	98.5	2,443	93.0	4,643	115.2	110	60.8	21,506	96.1
October	388	79.3	1,216	59.6	394	70.1	12,815	103.1	2,824	107.5	4,783	118.6	112	61.9	22,532	100.8
November	413	84.5	1,819	89.1	495	88.1	12,911	103.8	3,033	115.5	4,770	118.3	113	62.4	23,554	105.3
December	394	80.6	1,893	92.7	519	92.3	13,862	111.5	3,097	117.9	4,912	121.8	114	63.0	24,791	110.9
12 months ending December,																
1933	4,264	...	15,209	...	2,253	...	146,624	...	33,590	...	52,558	...	1,375	...	255,873	...
1932	3,899	...	13,620	...	1,202	...	150,094	...	28,097	...	50,761	...	1,747	...	249,420	...

NOTE: Index figures throughout are based on the monthly average for 1929=100. Issued January 26, 1933, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

COTTON AND FABRICS

GETTING off to a good start when the dollar was stabilized at 59.06¢ at the first of the month, cotton prices climbed more than 1¢ before speculators took profits and eased the market slightly.

Attention has been centered on the acreage-reduction campaign, the closing date of which was extended several times to bring in as many farmers as possible. At the last figuring, returns revealed about 80% of the farmers solicited agreeing to a 40% reduction in their acreage. Pressure was brought to bear on those who were reluctant to sign by notice that loans would be hard to get for those growers who did not cooperate. Then the Bankhead bill is another weapon which should bring recalcitrant signers into camp.

The Bankhead bill was at first strongly opposed by Secretary Wallace and other members of the Senate. But after a questionnaire had been sent to planters for their opinions on compulsory legislation, the Secretary reversed his stand. A majority favored the idea.

More important was the effect of the statement by President Roosevelt, who, writing to the chairman of the Senate and House Committees on Agriculture about control of output at the gins, said "that the Bankhead bills in principle best cover the situation."

Another control measure was proposed—this time for the Commodity Exchange. Stressing the importance of such control, Secretary Wallace said:

"Enactment of the legislation herein recommended will extend Federal regulation over commodities dealt in for future delivery covering approximately 95% of the volume of trading in all such commodities, based on value."

The exchanges themselves will first be given an opportunity to draft their own rules.

Along with the efforts at control, making for a smaller supply, are reports that consumption is picking up splendidly after a slump in December. The slackness in December, however, was caused by the curtailment of output inaugurated by mills operating under the NRA code, and one result of the cut is to put the mills in a fine statistical position. Forwardings have advanced; sales are larger; and a general price advance is expected. One of the largest cotton goods mills in the United States reported that the unfilled orders on its books were the greatest since 1928.

The cotton outlook is much brighter than last year. The administration has determined to set cotton prices back where they will yield a fair return to farmers, and between the 2 plans proposed, the smaller carry-over next year, and the larger consumption figures, its aims seem on the way to realization. Evidence of the faith in the future of cotton prices is the fact that cotton is being held so tightly in the South that brokers have difficulty in making deliveries.

Fears that intensive cultivation will spoil the acreage control plan would be made groundless if legislation similar to that introduced in the Bankhead bill were enacted.

Week ended February 3. Response to the new gold standard dollar at 59.06¢ raised cotton prices 42 to 57 points for the week. Buying was heavy early in the session, but slowed for a few days to close strong again at the week-end. The results of the acreage-reduction campaign held the interest of traders for most of the week despite the interest created by monetary changes. Early estimates from Texas put the acreage signed up with the government as 1,400,000 acres, and from the results in other quarters of the belt it looked as if the goal of 15,000,000 acres would be hard to obtain. Instead of the 5-year average of 100 pounds lint to the acre at first required, the new regulations called for 75 pounds. The time for the close of the campaign was extended 15 days to February 15, and it appears now that 75% of the growers will cooperate.

The carry-over of American cotton is expected to be greater than in any year since 1932, with a small floating supply. The January 1 domestic stock was estimated at 14,313,000 bales by the Cotton Exchange Service, including the cotton held by mills.

At the close on February 3, March sold at 11.59¢, compared with 11.17¢ the previous week; May 11.76 against 11.31; July 11.92 against 11.45; October 12.10 against 11.58; December 12.24 against 11.72; and January 12.34 against 11.77.

Secretary Wallace recently sent a questionnaire to farmers outlining 3 plans being considered, as follows: (a) Impose a tax applying to all cotton to be ginned or sold; (b) Assign to each cotton producer a definite number of bales that he may gin or sell; (c) Require that, when a majority of cotton producers have approved an acreage-reduction program, all cotton producers would be compelled to accept the program.

President Roosevelt was said to favor the plan whereby a tax would be placed on all excessive ginnings over an amount assigned by the AAA. His opinion was that the tax plan would stand up better than would the licensing plan if it came to a legal interpretation of the 2 methods. The President's reasons for favoring the tax plan were that farmers would cultivate unleased land more intensively, and non-cooperative farmers would bring new land into cultivation.

Forwardings to domestic mills in the January 27 week were 85,000 bales, compared with 113,000 in the previous week and 105,000 in the same 1933 week. Return to the gold standard helped buying, and trade and prices were brisk and firm.

The weekly Cotton Exchange statistics put forwardings for the season to date 240,000 above those of a year ago, and exports 125,000 bales behind those in the same 1933 period. The world's visible supply dropped 104,000 bales last week, against a gain of 40,000 in the same 1933 week, and 11,000 gain in 1932.

Week ended February 10. Every day during the week the season's tops were surpassed until the January position went above 13¢ at the close on Saturday. Setbacks there were, but a world-wide buying wave swept prices higher and higher. The principal influences were the Bankhead bill, proposing to limit the output from gins of the next crop, and a spot situation in the South which is making cotton abnormally difficult to secure. Under the fear of a limited crop, world mills bought feverishly with the market showing gains of 59 to 73 points for the week.

The March position closed at 12.32¢, against 11.59¢ last Saturday; May 12.46 against 11.76; July 12.63 against 11.92; October 12.83 against 12.10; December 12.99 against 12.24; and January 13.03 against 12.34.

The disturbances in France, causing a break in the franc on Monday, induced heavy selling, but not heavy enough to wipe out early gains. Later reports of martial law in Paris caused another flurry of selling outweighed again by domestic developments. Secretary Wallace approved legislation limiting the crop from gins to 9,000,000 bales; then it was reported that President Roosevelt had also urged prompt passage of the bill.

Figures for cotton loans thus far showed over $58,000,000 extended to farmers on unsold cotton of the 1933 crop at $50 a bale, and another $50,000,000 loaned by southern banks. It is estimated that these 2 sums are responsible for the withdrawal of 2,000,000 bales of cotton from the market.

The trade was also represented as believing that the carry-over at the beginning of next season would be 1,500,000 bales less than it was last season. Output was 13,177,000 bales; exports 8,500,000 bales; and consumption by domestic mills at 6,200,000 bales, making a carry-over of about 6,670,000 bales on July 31.

The acreage-reduction plan seems well on the way to successful conclusion with 80 to 90% of the farmers expected to sign up for the campaign reducing acreage from 40,000,000 to 25,000,000. Farmers who do not cooperate will probably find difficulty in getting

the advance of 10¢ a pound, it is said, while cooperating growers will participate in a fund of $130,000 set up for benefit payments.

The conversion of Secretary Wallace to the crop-control plan by restriction of ginnings was accomplished as a result of a recent questionnaire sent to 50,000 growers asking them their stand in the matter. About half replied, and tabulations of approximately 7,000 showed that 80 to 85% of farmers favor compulsory legislation, and only about 2% thus far definitely opposed it.

Because of the cut in output in December, which induced a drop of 162,000 bales below the November total, mills at present are in one of the soundest statistical positions they have experienced. With cotton prices rising so rapidly, prospects of a short crop next year, and the strong holding movement in the South, prices in the textile trade are expected by experts to advance next week. So far this year has been comparable to the large volume enjoyed last summer.

Week ended February 17. After hitting a peak in the advance movement, cotton prices met profit taking and eased off 9 to 14 points for the week. Turnover was heavy, with the holding movement still strong so that brokers have difficulty in filling contracts. The early stand of Secretary Wallace who criticised acreage legislation was modified at the week-end when the President revealed his favor of the Bankhead bill.

At the close March was 12.22¢, compared with 12.32¢ the week before; May 12.36 against 12.46; July 12.54 against 12.63; October 12.71 against 12.83; December was 12.86 against 12.99; and January was 12.89 against 13.03.

The President wrote in part as follows to Senator Smith and Representative Jones on the Bankhead bill: "My study of the various methods suggested leads me to believe that the Bankhead bills in principle best cover the situation. I hope that in the continuing emergency your committee can take action."

The bill provides for a tax of 12¢ on all cotton ginned in excess of 9,500,000 bales, and the fixing of subsequent quotas by the Secretary of Agriculture. The opposition feels that the acreage-reduction plan will result in a crop so small that regulation will not be necessary.

Another legislative matter which received attention was the proposed regulation of the commodity exchange. Secretary Wallace submitted the following drafts of proposed bills:

"Legislation to regulate the commodity exchanges should be designed to accomplish 2 general purposes:

"1. Prevent manipulation of prices and provide definite and positive means for limiting speculation and short selling in agricultural commodities, without interfering with legitimate marketing operations. . . .

"2. Prevent, under severe penalty, sharp practices and certain types of transactions which lend themselves to cheating or which are in themselves potent aids to manipulation. . . ."

Forwardings of cotton goods last week increased sharply, with cloth trading brisk, and prices stronger. One large concern reported the best business since 1928.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Feb. 3	11.78
Feb. 10	12.33
Feb. 17	12.48
Feb. 24	12.38

New York Quotations

February 24, 1934

		Cents
Drills		
38-inch 2.00-yard	yd.	$0.16⅞
40-inch 3.47-yard		.10¼
50-inch 1.52-yard		.24¼
52-inch 1.90-yard		.19⅜
52-inch 2.20-yard		.17⅝
52-inch 1.85-yard		.19¾
Ducks		
38-inch 2.00-yard D. F.	yd.	.17
40-inch 1.45-yard S. F.		.23⅞
72-inch 1.05-yard D. F.		.34⅜
72-inch 16.66-ounce		.36⅞
72-inch 17.21-ounce		.38
MECHANICAL		
Hose and belting	lb	.34¾
TENNIS		
52-inch 1.35-yard	yd.	.25¼
***Hollands**		
GOLD SEAL		
30-inch No. 72	yd.	.19½
40-inch No. 72		.21½
RED SEAL		
30-inch	yd.	.17
40-inch		.18½
50-inch		.24½
Osnaburgs		
40-inch 2.34-yard	yd.	.14½
40-inch 2.48-yard		.13½
40-inch 3.00-yard		.11¼
40-inch 10-ounce part waste		.16½
40-inch 7-ounce part waste		.12¼
37-inch 2.42-yard		.14⅛
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.11¼
Bombazine 60 x 48		.10½
Plaids 60 x 48		.11½
Plaids 48 x 48		.10¾
Surface prints 60 x 64		.12½
Surface prints 60 x 48		.11¾
Print cloth, 38½-inch, 60 x 64		.07¼
Print cloth, 38½-inch, 60 x 48		.06½
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.11¼
48 x 48, 2.85-yard		.10
64 x 68, 3.15-yard		.10⅝
56 x 60, 3.60-yard		.09⅜
44 x 48, 3.75-yard		.08
44 x 40, 4.25-yard		.06⅞
SHEETINGS, 36-INCH		
48 x 48, 5.00-yard	yd.	.06½
44 x 40, 6.15-yard		.05⅜
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.42¾
17¼ ounce 60" 10/5 ply Karded peeler	lb.	.37¾
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.42¾
12 ounce 60" 10/4 ply Karded peeler	lb.	.35
9¼ ounce 60" 20/4 ply Karded peeler	lb.	.42¾
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.36
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.42¾
23/4/3 Karded peeler, 1 1/16" cotton	lb.	.43¾
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.40¾
13/3/3 Karded peeler, 1 1/16" cotton	lb.	.39¾
7/2/2 Karded peeler, 1 1/16" cotton	lb.	.37¾
23/5/3 Karded peeler, 1¼" cotton	lb.	.37¾
23/5/3 Karded Egyptian, Egyptian upper cotton	lb.	.51¾
23/5/3 Combed Egyptian	lb.	.5871
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.35

*Prices for 1,200 yards of a width or over.

January consumption was reported at 508,034 running bales by the Census Bureau, compared with 348,393 in December and 470,182 in January, 1933. Exports are now 149,000 bales under last year's.

Week ended February 24. After last week's accelerated pace, the start of trading on Monday was mild in comparison. The market was easier in a light turnover. Wholesale goods quarters reported less inquiry than last week.

Lower Liverpool cables, and desultory trading here, made for further losses of 13 to 15 points on Tuesday. Because of the heavy snow storm, the opening of the Exchange was deferred until 10:45, and the attendance was meager. Trade and spot houses were the principal factors in the market. Trade news was scarce and the few traders who did appear found activity lagging.

The Census Bureau reported that the cotton spinning industry operated at 98.5% of capacity on a single shift basis in January, compared with 73.5% in December, and 95.1% in January, 1933.

On Wednesday, because of the holiday on Thursday and notices to be circulated Friday, eleventh-hour liquidation of the March position was large. Prices rose sharply in the last hour, but heavy selling caused a break and wiped out much of the improvement. The local market for spot cotton was steady. The acreage reduction indicates the smallest area to be cotton planted since 1905.

On Friday, after a rise, cotton dipped with stocks to close a point lower to 2 points higher than on Wednesday. In Saturday's market the firm spot month steadied cotton; while the influence of stocks and grains was also felt as prices dropped under profit taking. Uncertainty over developments in Washington continues to curtail trading.

Saturday's closing prices, as contrasted with last week's were: March 12.02¢ against 12.22¢; May 12.17 against 12.36; July 12.30 against 12.54; October 12.44 against 12.71; December 12.54 against 12.86; and January 12.58 against 12.86.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The cotton market in February was active, with prices advancing slowly and steadily. Supplies in certain quarters were rather scarce. The outlook is strong and good. Apparently there is little buying for speculation; it is chiefly for actual consumption. The trade is watching closely the developments in Washington, particularly regarding the progress of the Bankhead bill, which would limit cotton production to 9,500,000 bales and thus bring out strong price advances.

RAINCOAT FABRICS. Owing to the prevalence of extremely cold weather the

(*Continued on page* 70)

FINANCIAL

United Carbon Co.

The United Carbon Co., Empire State Bldg., New York, N. Y., and subsidiaries report for 1933 a profit of $636,217 after depreciation, depletion, and other deductions, but before federal taxes. This compares with a profit of $145,643 in 1932. Auditors state that federal income taxes for prior years still are in dispute, and no provision has been made therefor.

Current assets on December 31, last, including $667,759 cash, totaled $3,442,553, and current liabilities $536,594, compared with cash of $509,591, current assets of $3,159,707, and current liabilities of $521,392 at the end of the preceding year.

Capital stock at the close of 1933 consisted of 17,347 shares of 7% preferred and 370,127 no-par shares of common stock.

Thermoid Co.

The Thermoid Co., Trenton, N. J., and wholly owned subsidiaries, exclusive of Southern Asbestos Co., reported for 1933 a net income after interest, depreciation, federal taxes, and other charges, of $115,718, equal to $3.66 a share on 31,578 $100 par 7% preferred shares, contrasted with a net loss of $199,868 in the previous year. In 1933 a profit of $41,670 from discount on notes repurchased, less provision for federal taxes thereon, was credited directly to surplus.

Southern Asbestos Co., 96% owned subsidiary of Thermoid, for 1933 announced a net profit after expenses, depreciation, provision for federal and state income taxes, and other charges, of $7,128, contrasted with a net loss of $21,304 in 1932.

Dayton Rubber Mfg. Co.

Dayton Rubber Mfg. Co., Dayton, O., for the year ended October 31, 1933, reported a net profit after interest, federal taxes, and other charges of $183,239, contrasted with a net loss of $26,842 in the preceding fiscal year.

Collyer Insulated Wire

Collyer Insulated Wire Co., Pawtucket, R. I., (Collyer & Providence Insulated Wire Co., Inc.), for 1933 announced a net income before taxes, of $84,228.

New Jersey Zinc Co.

The New Jersey Zinc Co., 160 Front St., New York, N. Y., reported for 1933 a net income of $3,994,072 after taxes, depreciation, depletion, and other charges, including $588,705 proceeds from patents. This is equivalent to $2.03 a share on 1,963,264 shares of $25 par stock and compares with $2,013,120, or $1.02 a share, in 1932.

For the quarter ended December 31, 1933, net income was $1,108,783, after the same deductions, and including $170,438 proceeds from patents. This was equal to 56¢ a share and compared with a net income, including $418,267 proceeds from patents, of $1,514,909, equal to 77¢ a share, in the preceding quarter and $417,790, or 21¢ a share, in the final quarter of 1932.

Goodyear Tire & Rubber

The Goodyear Tire & Rubber Co., Akron, O., through President Paul W. Litchfield announced for 1933 a net profit of $6,021,535 and net sales of $100,635,636, an increase of $604,000 over 1932 sales. Following this statement the current quarterly 50¢ dividend on the company's first preferred stock was doubled. The dividend last year was reduced from $1.75 to 50¢ a quarter.

The directors also voted a dividend of $2 a share to holders of 7% preferred stock of record of February 23. This payment, due on March 1, will be applied against arrearage of the dividend, which last year was reduced from $7 to $2 a year.

Goodyear's net profits are equal after preferred dividend requirements to 47¢ a share on the 1,493,769 common shares. This compared with a net loss of $850,934 in 1932. The net profit included a special profit of $1,887,529 on a write-up of the previously depreciated values of the assets of foreign subsidiaries. The net loss for 1932 was after an inventory write-down of $6,475,327. Inventory valuations are now below market. The company reduced prior charges $538,667 by retirement of bonds and subsidiary preferred stock to a total of over $8,600,000 par value.

The balance sheet showed current assets of $106,565,692 and current liabilities of $9,185,172. Cash and government securities were $52,144,229.

B. F. Goodrich Co.

The B. F. Goodrich Co., Akron, O., after the regular monthly meeting of the board of directors on February 13, 1934, announced that the accounts for the fiscal year ended December 31, 1933, showed consolidated sales of $79,293,495 compared with $74,501,803 in 1932, the increase amounting to $4,791,692, or 6.43%.

Net profit for the year, after provision for depreciation, interest, and federal income taxes and deduction of profit applicable to subsidiary companies' capital stock not owned by the Goodrich company, amounted to $2,272,514, compared with a loss of $6,582,140 in 1932. The difference between cost and face value of the company's bonds and debentures acquired during the year and credited to income amounted to $2,374,937, compared with $2,500,957 in the prior year.

Raw materials on hand and material content of unfinished and finished goods were valued at the lower of cost or market on December 31, 1933. Materials on commitment at the end of the year were at prices below market prices on that date.

Total current assets total $53,322,766, and current liabilities $8,330,853, a ratio of 6.4 to 1. Cash, short term deposits, and government securities amounted to $12,091,364, which exceeded total current liabilities by $3,760,510.

Mohawk Rubber Co.

The Mohawk Rubber Co., Akron, O., for 1933 reported a net loss of $181,141 after depreciation, taxes, and other charges, compared with a net loss of $94,593 in 1932.

O'Sullivan Rubber Co.

O'Sullivan Rubber Co., Inc., Winchester, Va., for the year ended September 30, 1933, showed a net income of $96,998, equal to 45¢ a share on 215,000 capital shares.

World Rubber Shipments—Net Exports

	Long Tons		
	1933		1934
British Malaya	Nov.	Dec.	Jan.
Gross exports....	54,599	57,579	55,276
Imports	20,142	18,110	21,184
Net	34,457	39,469	34,092
Ceylon	6,363	6,966	7,551
India and Burma..	516	...	...
Sarawak	1,020	989	1,179
British N. Borneo..	*750	*750	...
Siam	1,191	1,046	1,290
Java and Madura..	6,684	7,030	...
Sumatra E. Coast..	9,951	10,183	...
Other N. E. Indies.	14,474	17,274	...
French Indo-China.	1,599	2,173	2,158
Amazon Valley	956	930	...
Africa	*100	*100	...
Totals	78,061	...	...

*Estimate. *Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.*

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Faultless Rubber Co.	Com.	$0.50 q.	Apr. 2	Mar. 15
Firestone Tire & Rubber Co.	Pfd.	$1.50 q.	Mar. 1	Feb. 15
Goodyear Tire & Rubber Co.	1st Pfd.	$1.00 q.	Apr. 1	Mar. 1
Goodyear Tire & Rubber Co.	1st Pfd.	$2.00 accum.	Mar. 1	Feb. 23
Norwalk Tire & Rubber Co.	Pfd.	$0.87½ q.	Apr. 2	Mar. 22
O'Sullivan Rubber Co.	Com.	$0.10 initial	June 30	May 31
Pirelli Co. of Italy	10%	....	....	....
Pirelli Co. of Italy	5% (extra)	......	....	....
Raybestos-Manhattan, Inc.	Com.	$0.25	Mar. 15	Feb. 28
United Elastic Corp.	Com.	$0.25 q.	Mar. 24	Mar. 7

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TECHNICAL SUPERINTENDENT OR CHEMIST. 20 YEARS' EXperience tires, tubes, mechanicals, hard rubber, specification goods. Thoroughly qualified in compounding development, research, and control work. Desires to get in touch with a company that needs a chemist or superintendent. References furnished to check my qualifications. University graduate. Address Box No. 332, care of INDIA RUBBER WORLD.

CHEMIST, RESEARCH RUBBER COMPOUNDER, 29, PRACTICAL, resourceful, 3 years' experience in footwear compounds and analytical work, desires connection. Reputed A-1 man. Address Box No. 333, care of INDIA RUBBER WORLD.

GENERAL FOREMAN. PRACTICAL MAN WITH 14 YEARS OF experience in rubberizing all kinds of fabrics for automotive manufacturers and for raincoat materials. Employed at present. Desires new permanent connection. Best of reasons for seeking change. Address Box No. 334, care of INDIA RUBBER WORLD.

YOUNG MAN, 3 YEARS' EXPERIENCE SUCCESSFUL MANUFACture cotton flock surfaced rubberized fabrics, desires new connection. Not chemist. Specializing in machines and production. Available on short notice. Address Box No. 335, care of INDIA RUBBER WORLD.

EXPERIENCED RUBBER CHEMIST, DESIRES POSITION AS DEvelopment man or assistant superintendent. Successful experience includes development of suede and leatherette clothing, upholstery, auto topping, and lacquered rubber fabrics. Have knowledge of latex compounding and procedures for latex clothing, sheet rubber, and associated products. Address Box No. 336, care of INDIA RUBBER WORLD.

EXPERIENCED RUBBER CHEMIST AND TECHNOLOGIST. 9 years' experience in compounding and manufacture of a wide variety of rubber goods, chiefly mechanicals and dipped goods, including latex. College man. Excellent references. Address Box No. 342, care of INDIA RUBBER WORLD.

SUPERINTENDENT, AGE 38, 18 YEARS' EXPERIence manufacturing molded goods, battery cases, plumbers' specialties, inner tubes. Thorough experience on mills, calenders, tube machines, presses, and compounding. Can handle help and produce results at minimum costs. Now employed; seeking new connection. Good reason for change. Address Box No. 344, care of INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

ASSISTANT SUPERINTENDENT OR GENERAL FOREMAN: EXperienced in both soft and hard rubber mechanicals, calenders, mills, and presses. Knowledge of compounding. Reputed excellent handler of men. Address Box No. 345, care of INDIA RUBBER WORLD.

EXPERT IN ALL KINDS OF RUBBERIZING, ALSO TOY BALLS and toys, new process, wish to change. Up-to-date compounder. Address Box No. 346, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

WANTED: EXPERIENCED SALESMAN TO REPRESENT MANUfacturer of molded flat goods, such as hot water bottles, syringe bags, mats and drains, etc., on commission basis in Chicago territory, San Francisco, and New Orleans. State previous experience and connections. Address Box No. 331, care of INDIA RUBBER WORLD.

WANTED: GRADUATE INDUSTRIAL CHEMIST. CONSIDERAtion will be given ONLY to applicants with thorough PRACTICAL experience in the manufacture of tires, mechanical goods, and shoes. Initial communication must give full details and salary expected, all of which to be kept in strict confidence. Address Box No. 339, care of INDIA RUBBER WORLD.

COMPOUNDER EXPERIENCED IN MANUFACTURE OF MOLDED goods and specialties. Give complete information in first letter. Address Box No. 338, care of INDIA RUBBER WORLD.

WANTED: RUBBER TECHNOLOGIST (GRADUATE) WITH WIDE manufacturing knowledge. Must be able to handle production equipment and men. Application should cover completely past responsibilities, also remuneration demanded. Barring this information which will be deemed personal, no offer will receive attention. Address Box No. 340, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

BRITISH RUBBER MANUFACTURERS MAKING MOLDED MATS and mattings in bright attractive colorings, desire to negotiate with United States manufacturer for rights of sole manufacture and marketing in United Kingdom of other lines, preferably patented. Reply in confidence to Fortifex Ltd., York, England.

FOR RENT—REASONABLE: A SMALL RUBBER FACTORY well equipped for molded goods. Located in Detroit area. Present operators can turn over $50,000 annual business. Address Box No. 343, care of INDIA RUBBER WORLD.

(*Advertisements continued on page 71*)

Crude Rubber

(*Continued from page* 58)

3,450 tons, and on Tuesday prices lost about 9 points more in easier trading.

Last week's automobile output, as given by *Cram's Automotive Reports*, showed 63,794 units, against 65,143 the previous week, and 24,927 a year ago. Despite the recent stepped-up rate of production automobile dealers are said to be far short of their requirements for display and stock models.

On Wednesday crude rubber futures, turning firm after several days of weakness, went up several points. The spot price also recovered moderately. Thursday was a holiday.

Despite a reaction late in the day when stocks went down, crude rubber futures advanced again Friday. Restriction continues to present difficulties. Saturday's market started unchanged to 8 points lower and continued to slump in moderate activity because of reports of large Dutch East Indies shipments for January and the weak stock market.

Closing prices, compared with last Saturday's, follow: March 10.46¢ against 10.64¢; May 10.78 against 10.89; July 11.06 against 11.18; October 11.38 against 11.52; and December 11.65 against 11.72.

Factory business early in the week was still fairly good. Unless restriction is killed, or put off indefinitely, rubber manufacturers probably will continue to nibble at the market, and even take a big bite as the rumors bring accord nearer and nearer. For the week actuals receded $\frac{1}{16}$¢, with the last quarter positions unchanged; futures declined 7 to 16 points.

Saturday's closing prices, contrasted with last week's, were: spot $10\frac{5}{8}$¢ against $10\frac{11}{16}$¢; April-June $10\frac{7}{8}$ against $10\frac{15}{16}$; July-September $11\frac{1}{4}$ against $11\frac{5}{16}$; and October-December $11\frac{5}{8}$ unchanged.

Cotton and Fabrics

(*Continued from page* 66)

spring raincoat business is very late in starting. By all indications, however, the trade is looking forward to doing the largest spring business in its history.

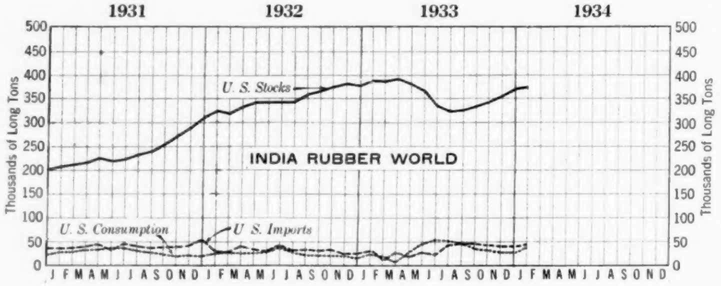
SHEETINGS. During February the trade experienced a very active market in grey goods. More sheeting is being sold each week than is being manufactured.

TIRE FABRICS. There has been a uniform increase of 1¢ a pound in market quotations throughout the entire list of tire fabrics, except cord fabrics of 23/5/3 karded Egyptian uppers, which dropped from 53.75¢ per pound to 51.75¢, and 23/5/3 karded peeler, $1\frac{1}{4}''$ cotton, which dropped from 50.75¢ to 37.75¢.

Ethylene Diamine

Ethylene diamine is now being produced on a semi-commercial scale. Data are not yet available on its use in the rubber industry as a stabilizer of latex solutions and to retard the time of curing. Like triethanolamine, however, it should have possibilities in this direction.

IMPORTS, CONSUMPTION, AND STOCKS



United States Stocks, Imports and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,825	40,455	127,103	55,458	797,441	668,660	495,724
1932	400,787	332,000	379,000	38,360	92,567	36,802	709,840	670,250	518,187
1933									
January	31,110	22,906	385,811	32,539	89,050	35,746	63,951	52,120	521,173
February	18,875	21,638	381,794	32,898	90,172	34,354	56,056	54,900	518,166
March	27,879	18,047	390,135	29,531	94,565	34,089	61,932	59,100	518,812
April	19,459	26,226	382,167	30,745	95,066	33,520	57,180	61,300	510,753
May	27,556	44,580	364,623	43,342	98,538	37,876	67,050	76,840	501,037
June	22,729	51,326	333,954	63,608	102,451	46,412	62,330	74,110	482,817
July	44,290	50,184	326,609	57,435	99,859	53,179	74,078	76,200	479,646
August	44,802	44,939	325,418	53,084	96,623	51,110	73,954	79,230	473,151
September	47,352	35,686	334,637	57,255	94,972	51,456	75,875	74.670	473,899
October	43,016	31,906	343,579	58,568	89,707	46,747	85,337	69,400	480,033
November	42,448	29,162	353,852	57,140	87,918	48,266	78,592	66,500	490,036
December	42,099	29,087	364,541	55,606	86,438	48,744	88,956	74,000	499,723
1934									
January	46,204	40,413	368,660	45,768	......	......	......	......	......

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

World Rubber Absorption—Net Imports

	Long Tons—1933 Oct.	Nov.	Dec.
CONSUMPTION			
United States	31,906	29,162	29,087
United Kingdom	8,629	5,737	8,003
NET IMPORTS			
Australia	604	301	190
Austria	94	276	402
Belgium	1,118	1,129	...
Canada	2,580	2,184	1,773
Czechoslovakia	686	882	...
Denmark	237	177	147
Finland	105	111	63
France	4,921	5,419	5,415
Germany	4,772	4,086	4,933
Italy	1,836	942	...
Japan	6,212	6,296	...
Netherlands	310	222	213
Norway	36	107	...
Russia	2,084	...	...
Spain	441	493	...
Sweden	399	483	442
Switzerland	49	42	161
Others	*1,450	*1,450	*1,450
Totals	68,469	...	...
Minus U. S. (Cons.)	31,906	29,162	29,087
Total Foreign	36,563	...	...

*Estimate to complete table.
Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.

CONSUMPTION of crude rubber by United States manufacturers for January, 1934, amounted to 40,413 long tons, against 29,087 long tons for December, 1933, an increase of 38.9% over December and 76.4% over January, 1933, according to the R. M. A. Consumption for January, 1933, was 22,906 long tons.

Crude rubber imports for January, 1934, were 46,204 long tons, an increase of 9.8% over December, 1933, and 48.5% above January, 1933.

The estimated total domestic stocks of crude rubber on hand January 31, 1934, were 368,660 long tons, compared with December 31, 1933, stocks of 364,541 long tons. January stocks increased 1.1% over those of December, 1933, but were 4.4% below stocks of January 31, 1933.

Crude rubber afloat for the United States ports on January 31, 1934, was 45,768 long tons compared with 55,606 long tons afloat on December 31, 1933, and 32,539 long tons afloat on January 31, 1933.

London and Liverpool Stocks

Week Ended	Tons London	Liverpool
Feb. 3	39,064	51,937
Feb. 10	39,509	52,615
Feb. 17	40,133	52,920
Feb. 24	39,775	52,944

Classified Advertisements

Continued

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: COMPLETE LABORATORY EQUIPMENT FOR liquid latex including Colloidal Mill, U. S. Jr. Production Model, capacity 60 gals. per hr., complete with motor and starter; Bausch & Lomb Microscope; Viscosimeter; Barnstead Water Still; Experimental Dipping Machine with Frigidaire Unit; Mixers; Scales, etc. All practically new. Address Box No. 337, care of INDIA RUBBER WORLD.

1 WARREN HORIZONTAL DUPLEX BOOSTER PUMP SIZE 12" x 10" x 12", 400 gallons per minute, practically new; 7,500 heel mold impressions 3/8, 1/2" and whole heel molds. All standard nailing. Address Box No. 341, care of INDIA RUBBER WORLD.

FOR SALE: ONE 18 BY 54" BIRMINGHAM 4-ROLL CALENDER; one unused 18 by 30" heavy duty FARREL MILL, chain drive; complete line of W. & P. Mixers, Vacuum Shelf Driers, Calenders, Mills, Colloid Mills, Pebble Mills, Dough Mixers, Hydraulic Presses, Pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

United States Statistics

Imports of Crude and Manufactured Rubber

	November, 1933		Eleven Months Ended November, 1933	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	90,903,463	$5,850,714	825,117,324	$38,164,508
Liquid latex	2,774,640	282,065	21,939,805	1,563,138
Jelutong or pontianak	1,401,172	125,160	11,831,257	801,027
Balata	68,622	11,252	3,622,517	2,241,861
Gutta percha	58,538	7,769	1,287,839	88,155
Siak, scrap, and reclaimed	942,669	7,584	6,247,689	49,157
Totals	96,149,104	$6,284,544	870,046,431	$42,907,846
Chicle, crude *Free*	447,397	$154,039	3,452,589	$947,294
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers *pairs*	295,698	$74,204	4,467,821	$738,232
Rubber toys	......	17,180	......	378,486
Druggists' sundries, n. e. s.	......	4,146	......	36,244
Combs, hard rubber *number*	114,324	6,029	3,249,764	105,997
Golf balls *number*	17,244	5,802	1,065,440	254,373
Tennis and other rubber balls *number*	21,288	2,128	1,520,684	81,749
Tires *number*	503	3,356	24,875	126,184
Other rubber manufactures	......	40,141	......	456,064
Totals	......	$152,986	......	$2,177,329

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	4,901,916	$333,631	41,773,557	$2,307,662
Balata	9,896	1,930	181,163	26,279
Guayule	67,200	8,064	87,500	10,500
Gutta percha, rubber substitutes, and scrap	......	......	17,291	3,759
Rubber manufactures	......	74	......	17,284
Totals	......	$343,699	......	$2,365,484

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	609,932	$24,612	7,113,528	$267,047
Scrap	5,783,120	100,830	43,056,107	645,925
Rubberized automobile cloth, *sq. yd.*	90,114	39,453	642,045	259,252
Other rubberized piece goods and hospital sheeting *sq. yd.*	39,412	14,770	569,018	201,662
Footwear				
Boots *pairs*	6,569	14,368	65,654	119,317
Shoes *pairs*	30,917	15,437	152,460	69,230
Canvas shoes with rubber soles *pairs*	6,751	9,502	269,315	135,931
Soles *doz. pairs*	1,691	3,576	16,845	32,782
Heels *doz. pairs*	33,692	18,579	328,905	168,492
Water bottles and fountain syringes *number*	16,859	6,678	171,682	61,299
Gloves *doz. pairs*	5,207	10,805	59,482	118,013
Other druggists' sundries	......	29,123	......	266,653
Balloons *gross*	49,226	40,666	220,542	187,820
Toys and balls	......	7,252	......	39,947
Bathing caps *doz.*	7,757	9,544	63,422	103,621
Bands	26,041	7,967	230,263	63,913
Erasers	34,476	20,143	299,987	162,085
Hard rubber goods				
Electrical goods	56,384	7,112	949,227	91,566
Other goods	......	9,181	......	105,616
Tires				
Truck and bus casings, *number*	19,047	300,910	185,012	2,938,976
Other automobile casings, *number*	73,519	506,420	740,398	4,997,973
Tubes, auto *number*	59,505	62,729	580,359	610,640
Other casings and tubes, *number*	1,502	3,313	22,379	51,647
Solid tires for automobiles and motor trucks *number*	628	18,202	6,081	161,558
Other solid tires	175,120	17,690	1,012,824	110,448
Tire sundries and repair materials	......	35,622	......	337,606
Rubber and friction tape	49,753	11,240	553,452	120,475
Belting	153,125	72,176	1,605,990	703,012
Hose	281,847	91,330	2,663,176	721,090
Packing	89,232	39,512	925,317	360,701
Thread	172,670	88,468	1,361,916	710,021
Other rubber manufactures	......	90,757	......	884,186
Totals	......	$1,727,967	......	$15,808,504

London Stocks, December, 1933

			Stocks, December 31		
LONDON	Landed Tons	Delivered Tons	1933 Tons	1932 Tons	1931 Tons
Plantation	3,373	3,896	35,597	37,358	69,430
Other grades	13	14	18	49	40
LIVERPOOL					
Plantation	*1,211	*2,167	*50,823	*55,160	*57,633
Total tons, London and Liverpool	4,597	6,077	86,438	92,567	127,103

*Official returns from the recognized public warehouse.

Rubber Goods Production Statistics

TIRES AND TUBES		1933 November	1932 November
Pneumatic casings			
Production	*thousands*	2,432	1,843
Shipments, total	*thousands*	1,758	1,369
Domestic	*thousands*	1,686	1,306
Stocks, end of month	*thousands*	7,397	5,964
Solid and cushion tires			
Production	*thousands*	11	6
Shipments, total	*thousands*	9	6
Domestic	*thousands*	8	5
Stocks, end of month	*thousands*	28	23
Inner tubes			
Production	*thousands*	2,290	1,604
Shipments, total	*thousands*	1,682	1,263
Domestic	*thousands*	1,636	1,221
Stocks, end of month	*thousands*	6,900	5,330
Raw material consumed			
Fabrics	*thous. of lbs.*	10,447	7,827
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments	*thous. of lbs.*	185	170
Rubber clothing, calendered			
Orders, net	*no. of coats and sundries*	14,878	22,353
Production	*no. of coats and sundries*	38,342	38,704
Rubber-proofed fabrics, production, total	*thous. of yds.*	2,458	3,890
Auto fabrics	*thous. of yds.*	318	332
Raincoat fabrics	*thous. of yds.*	1,165	2,461
Rubber flooring, shipments	*thous. of sq. ft.*	268	307
Rubber and canvas footwear			
Production, total	*thous. of prs.*	....	5,007
Tennis	*thous. of prs.*	....	1,385
Waterproof	*thous. of prs.*	....	3,623
Shipments, total	*thous. of prs.*	....	5,375
Tennis	*thous. of prs.*	....	454
Waterproof	*thous. of prs.*	....	4,922
Shipments, domestic, total	*thous. of prs.*	....	5,330
Tennis	*thous. of prs.*	....	422
Waterproof	*thous. of prs.*	....	4,908
Stocks, total, end of month	*thous. of prs.*	....	15,038
Tennis	*thous. of prs.*	....	5,955
Waterproof	*thous. of prs.*	....	9,083
Rubber heels			
Production	*thous. of prs.*	15,955	14,162
Shipments, total	*thous. of prs.*	11,287	13,188
Export	*thous. of prs.*	337	184
Repair trade	*thous. of prs.*	4,552	3,966
Shoe manufacturers	*thous. of prs.*	6,398	9,038
Stocks, end of month	*thous. of prs.*	38,436	21,749
Rubber soles			
Production	*thous. of prs.*	4,054	4,780
Shipments, total	*thous. of prs.*	2,763	4,420
Export	*thous. of prs.*	2	5
Repair trade	*thous. of prs.*	409	316
Shoe manufacturers	*thous. of prs.*	2,351	4,099
Stocks, end of month	*thous. of prs.*	5,559	2,559
Mechanical rubber goods, shipments			
Total	*thous. of dollars*	2,836	1,990
Belting	*thous. of dollars*	607	423
Hose	*thous. of dollars*	1,013	709
Other	*thous. of dollars*	1,216	858

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Low and High New York Spot Prices

All Prices in Cents per Pound

	February		
PLANTATIONS	1934*	1933	1932
Thin latex crepe	11¼/12¼	3⅝/3 11/16	4[illegible]/4⅞
Smoked sheet, ribbed	9 13/16/10¾	2⅞/3	3[illegible]/4¼
PARAS			
Upriver fine	9 / 9¾	6 /...	5¼/5½

*Figured to February 24, 1934.

Imports by Customs Districts

	December, 1933 *Crude Rubber		December, 1932 *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	8,240,264	$583,706	6,876,524	$229,388
Rochester	4,654	862	......	......
New York	67,408,984	4,617,869	54,907,754	1,887,359
Philadelphia	5,177,603	297,124	831,617	33,148
Maryland	6,337,664	393,153	1,637,735	56,307
Mobile	......	......	438,760	14,053
New Orleans	420,071	17,271	179,200	5,412
Los Angeles	3,467,344	213,206	6,412,616	197,045
San Francisco	208,888	15,917	71,885	3,120
Oregon	14,784	739	11,200	491
Ohio	2,500	242	67,865	3,513
Colorado	......	......	280,000	9,475
Totals	91,282,756	$6,140,089	71,715,156	$2,439,311

*Crude rubber including latex dry rubber content.